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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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The National Computer Conference opens in Houston one week from today. A special *Computerworld* preview of what to expect at the biggest show the computer industry puts on every year follows Page 60.

Mini Maker Wang Unveils Its First Personal Computer

By Bruce Hoard
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. took the wraps off its first personal computer along with a flurry of additional products and enhancements here last week.

The Wang Professional Computer was the top draw on a card that featured two entry-level VS office computer systems, a multifunction graphics workstation and enhancements to the 2200 minicomputer systems (story at right), as well as a 640M-byte fixed disk drive, a tape cartridge unit and VS software (story on Page 8).

The 16-bit Professional Computer reportedly functions as a workstation on any Wang 2200, VS, OIS or Alliance system. It can operate in stand-alone mode, through coaxial cable to other Wang products, through telephone lines to Wang and other devices or through the company's Wangnet local-area network.

The personal computer runs under Microsoft Corp.'s MS-DOS and has optional Digital Research, Inc. CP/M emulation. Through MS-DOS, the Professional Computer user can run most of the applications programs now offered by more than 70 companies for the IBM Personal Computer, a Microsoft spokesman said. Other Microsoft options include Pascal, Fortran and Cobol com-

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Two VS Systems, Too

LOWELL, Mass. — Two entry-level VS office computer systems, a multifunction graphics workstation and enhancements to the 2200 minicomputer systems were among the announcements made by Wang Laboratories, Inc. here last week.

The new entry-level VS 25 system includes a 1.2M-byte, dual-sided, double-density diskette drive (DSDD), a 16-port serial device controller and a fixed disk device controller. Up to 10 of the serial devices can be workstations. The VS 25 can be configured with 256K, 384K or 512K bytes of memory, 34K or 68K bytes of fixed disk

(Continued on Page 8)

No Security Checks; Hospital Now Sorry

By Jake Kirchner
CW Washington Bureau

BALTIMORE — Officials at the University of Maryland Hospital here were puzzled last year when their assistant systems chief kept putting off a security audit of the hospital's DP operations.

That puzzlement turned to chagrin when a computer operator was indicted and subsequently convicted of embezzling $40,000 through the hospital's computer system. The indictment came just one week before the accounting firm of Coopers & Lybrand began the audit.

Now the hospital management is even more dismayed because the assistant DP manager — described by a co-worker as "a good, solid, professional worker" — has also been indicted, charged with embezzling more than $100,000 and accepting more than $40,000 in bribes from DP consultants.

The ultimate blow, however, came when the hospital discovered that both employees had criminal records for embezzlement — records that were not discovered until after the indictments because the hospital did not conduct security checks before hiring the two.

In the most recent indictment, a state grand jury charged Eugene B. Slear Jr., former hospital assistant director for finance and systems, with accepting $41,095 in bribes from a DP consultant and with stealing more than $126,564 with the aid of another contractor.

Slear resigned from the hospital last June to become vice-president for data processing at Carlson Steel Co. in Coatesville, Pa. He was indicted along with Thomas M. Boyle Jr. of Villanova, Pa.,

(Continued on Page 7)

DEC, Intel, Tektronix Ink Pact

Vendors Eye Graphics Standards

By Tim Scannell
CW Staff

BEAVERTON, Ore. — Three major computer firms last week announced a joint plan to establish software standards for the standardless graphics industry.

Digital Equipment Corp., Intel Corp. and Tektronix, Inc. have agreed to pool their efforts and dedicate "significant" resources to formulate standards for both low-level graphics instructions and videotex — the transmission of both data and graphics — according to a Tektronix spokeswoman here.

The agreement, which could have a far-reaching effect on both graphics systems users and vendors, marks the first time that any vendors have banded together to back specific standards for the graphics industry, sources said. The effort reportedly has the sanction of the American National Standards Institute.

The three firms are promoting two types of standards: the Virtual Device Interface protocol, which concerns low-level graphics commands such as MOVE and DRAW, and the North American Presentation-Level Protocol System, a videotex standard initiated in Canada

(Continued on Page 4)

NBS May OK 'E Mail' Standard By This Fall

By Bruce Hoard
CW Staff

WASHINGTON, D.C. — The National Bureau of Standards has nearly completed an electronic mail standard that is supported by the major electronic mail vendors and may be approved by this fall.

The technical part of the standard is "frozen," according to Shirley Watkins, manager of the Computer-Based

(Continued on Page 6)

Los Alamos Photo by H. Ortega

Cheaper by the Dozens?

The Los Alamos National Laboratory, where the nation's top-secret nuclear weapons are developed, is home to 100 mainframes. Four are Cray Research, Inc. supercomputers like the one above; a fifth is on order. Story on Page 15.

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Ties to Monolithic Theft Seen

Chip 'Sting' Operation Nets Four

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — A police-directed "sting" operation ended recently with the arrest of four suspected members of one of Silicon Valley's many chip-stealing rings.

The suspects, none of whom is more than 20 years old, are believed to be minor players in a semiconductor-theft operation that apparently includes at least two additional members, both still free. Those two are said to be the targets of a second sting operation that local police hope to put into action "within a few days," according to Santa Clara County Sheriff's Department deputy Pat Moore.

At least one of the two would-be sting victims may have helped perpetrate the largest single electronics heist in Silicon Valley's history, Moore said. That record rip-off occurred last Thanksgiving weekend when thieves breached a supposedly impregnable storage room at Monolithic Memories, inc. and stole $3.4 million worth of the company's most advanced circuitry.

Although the theft led to several subsequent arrests, the whereabouts of the estimated 500,000 missing components remains a mystery.

Local police know of no evidence linking the Monolithic Memories case to the four youths who were recently taken into custody, Moore said, identifying them as John Joseph Palmer, Eugene Pestoni and brothers Hector and Norbert Diaz. They have been charged with conspiracy and attempted possession of stolen property.

The quartet's arrest took place during the evening of May 19, several months after area police received a tip that the suspects might have ties to Silicon Valley's brisk trade in stolen semiconductors. After observing the subjects' actions for some time, undercover investigators posing as local chip thieves approached the four and offered to sell them approximately 75,000 integrated circuits worth an estimated $625,000.

Police described the devices, mainly erasable programmable read-only memories, as stolen. In fact, the components were lent to the investigators as bait by a Silicon Valley semiconductor manufacturer. Moore declined to release the cooperating vendor's name because "within a few days, we plan to conduct another sting operation using the same company's products."

After purportedly selling the "stolen" chips to the suspects for about $8,000, police trailed Pestoni and Palmer as they allegedly transported the goods first to a house in nearby Redwood City and then to a public storage locker in Modesto. Police had planned to keep the locker under continuous surveillance, but a manpower storage reportedly forced the investigators to abandon their original plan and limit their arrests to the four suspects in Modesto.

Intruder Guns Down Terminals

HONOLULU — In what appears to have been a prank, shots were fired into eight CRT terminals at the University of Hawaii here last week.

Early in the morning of Sunday, May 23, an unidentified person entered an unlocked room in a university dormitory that contained 19 remote terminals and fired the shots from a .22 caliber weapon, according to Albert Higashi, assistant director of the college's computer center. "Usually at this time of year, just after final exams, we have a lot of pranks on campus," Higashi said.

The estimated damage to the terminals was $6,000; most of the CRTs will be repaired. The damaged equipment included two Control Data Corp. Plato terminals and six Teleray Corp. terminals. The terminals were used by students to access the main computer at another location on campus.

"The room is locked for the time being," Higashi said, "but we will eventually figure out a way to keep it secure. We may put an armed guard outside or something like that."

The police have no suspects in the shooting.

'Computerworld/Japan' Launched

FRAMINGHAM, Mass. — CW Communications, Inc. has launched *Computerworld/Japan*, a weekly publication aimed at computer users in Japan.

The new publication is in magazine format and has an initial circulation of 30,000 readers among computer-using organizations and key members of the computer industry, government and consulting establishments. The premier issue appeared during the first week of April.

Computerworld/Japan is published in Tokyo by Computerworld Japan, K.K., a wholly owned subsidiary of CW Communications, Inc. The publication has 14 experienced editorial, production, circulation and publication management personnel.

Shohei Kurita is president of the company, Shunji Mizuguchi is editor of the publication and Takeshi Kikuchi is advertising director.

Computerworld/Japan is the latest addition to CW Communications' worldwide network of 15 computer publications consisting of more than 200 reporters, editors and information analysts.

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IN-LAWS

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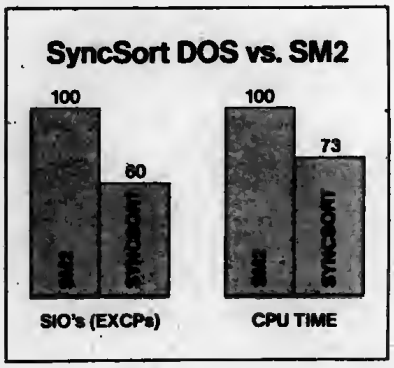

High performance computer without high performance sort program like bride without groom—expectation without fulfillment.

—Old Chinese Proverb.

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The War That Didn't Have to Happen?

By Jim Bartimo
CW Staff

SAVAGE, Minn. — A computer simulation of the Falkland Islands war has been developed and offered to British Prime Minister Margaret Thatcher and Argentine President Leopoldo Galtieri as an alternative to the real thing.

The developer of the simulation, Gerald Van Diver, explained in an interview last week how it works: "You'd be looking at a graphics representation of the islands. You'd send the troops in to invade the islands and [when they won a battle], they would take a part of the islands home with them. After a certain amount of ground was taken, the islands would sink and, at that point, the score would be tallied up."

The idea behind the simulation is that the decisions of war will deliver the same results in a computer representation as they will on the battlefield. "War is nothing more than a statistical analysis of human lives, guns, geographic locations and dollars," Van Diver said. "Realistically, you could have a bloodless war."

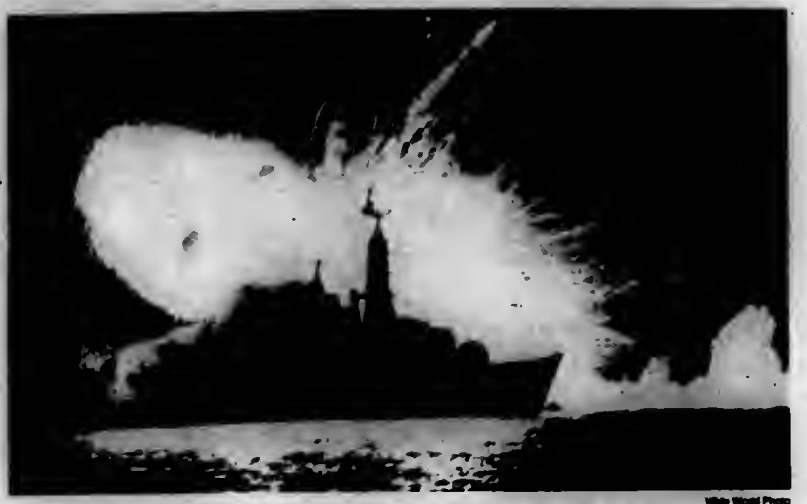
Letters from Van Diver to both Thatcher and Galtieri offer the computer simulation to the nations' defense experts. Negotiations before the simulated battle began would ensure that both countries agree the outcome is final, Van Diver said.

Van Diver is part owner of Vital Information, Inc., a publishing and consulting firm. He developed the simulation to run on Apple Computer, Inc.'a Apple II, the IBM Personal Computer or any microcomputer using the Digital Research, Inc. CP/M operating system.

"We designed the simulation so there is a score involved," Van Diver said. "You can set up a defense system around the islands. Scoring is determined by how you defend the islands. The computer would do all the number crunching." The winner of the war would be the country with the most points.

Using the sinking of the British destroyer *HMS Sheffield* as an example of how a battle could be fought on the computer, Van Diver said, "You'd have had the same statistics as in the real war. It would have been simulated all in terms of numbers. [The Argentine army would have asked,] 'How much am I willing to spend to sink that ship?' "

The victorious country would be the one that used its money, arms and troops to the same stategic advantage that they would have in a real war. "Can't we do all that stuff on the computer?" Van Diver asked of world leaders.



Wide World Photo

The British frigate *HMS Antelope* explodes off East Falkland before sinking last week after an attempt was made to defuse an unexploded Argentine bomb lodged in the engine room. If Margaret Thatcher and Leopoldo Galtieri had simulated the Falkland Islands war instead of fighting it, simulation developer Gerald Van Diver believes, no lives would have been lost.

DEC, Intel, Tektronix Eye Graphics Standards

(Continued from Page 1)

for the transmission of graphs and textual information.

If adopted, both protocols would affect virtually all graphics equipment, from the simplest CRT terminal to large-scale scanners and graphics processors, the Textronix spokeswoman explained. She observed, however, that the main benefactor of such a move would be the user, enabling one to transport software from one system to another without any major modifications.

Although Ken Anderson, a graphics consultant and publisher, was not aware of the agreement when contacted, he compared the venture to similar joint efforts by computer companies — including DEC — to establish standards for local-area networks.

Anderson declined to offer his thoughts on the future success of the DEC-Intel-Tektronix agreement until he could review the full announcement. However, he did find it significant that DEC — a leader in minicomputers — and Intel — whose 8086 chip is installed in nearly every graphics system on the market today — agreed to cooperate, especially since the proposed standards will ostensibly be incorporated into DEC's recently introduced personal computer and make their way into the computer's targeted office automation market.

While the agreement marks the first time that several vendors have announced a cooperative graphics standards effort, it is not the first time that standards have been proposed. The Association for Computing Machinery'a Special Interest Group on Computer Graphics began pushing the standards issue in the early 1970s. It was later taken up and promoted by Ansi and its X3H3 committee, which has been working to adopt programming format standards for several years, Anderson said.

Other major standards efforts include one from Germany, which is trying to push its "GKS" graphics standard presently under consideration by the International Standards Organization, and a graphics standard promoted by the U.S. government. The government's standard — the Interactive Graphics Exchange Specification — affects the formatting of geometric information for computer-aided design and manufacturing systems.

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GENERAL ELECTRIC

Justice, CAB Investigating

Charges of Airline DP 'Dirty Tricks' Probed

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Justice Department and the Civil Aeronautics Board (CAB) are conducting separate investigations into allegations that one or more airlines illegally manipulated their automated reservation systems to hurt their competitors.

The two agencies would not comment specifically on the origin of the investigations, but a CAB spokesman said "We have received allegations of what have been termed 'dirty tricks' in Dallas/Fort Worth."

An executive of Braniff International Corp., which is headquartered in Dallas, used that same term recently when charging American Airlines, also based in Dallas, with using its Sabre reservations system to sabotage Braniff reservations. Braniff, a customer of the Sabre system, said the sabotage was part of an effort to force the financially ailing Braniff out of business [CW, May 24].

Justice Department

While the CAB probe is restricted to supposed events in that part of the country, the Justice Department investigation is a nationwide antitrust study of airline reservation and scheduling system practices. This investigation is in addition to a federal grand jury investigation in Texas, which is looking into Braniff's charges of unfair methods of competition by American Airlines.

The antitrust probe, being conducted by the transportation section of the Justice Department's Antitrust Division, is "a preliminary civil investigation to see if airlines might be using their computer reservation and scheduling systems that go into travel agent offices to benefit the host company and to hurt [airline] competitors," Justice Department spokesman Mark Sheehan said last week.

Several airlines, most notably American and United Airlines, market their automated systems to other carriers who sign co-host agreements with the system provider and to travel agents as on-line systems for checking flight schedules and seating availability.

Braniff has such an arrangement with American's Sabre system, one of the leading systems in the business. Sheehan remarked that any airline offering this kind of service would be required by antitrust laws to provide it on a nondiscriminatory basis. It would be illegal, he said, for the system provider to "manipulate it to the disadvantage of [co-host] competitors."

According to Braniff, however, American used its control of Sabre to bias the system in favor of American flights and, even further, to show incorrectly some Braniff flights as fully booked and to cancel some Braniff reservations and switch them to American.

American officials have vehemently denied these charges. Users of the Sabre system, however, have maintained that the kinds of manipulation and dirty tricks alleged by Braniff are, at least in theory, technically possible. Furthermore, they would be difficult to trace.

Sheehan emphasized that the antitrust investigation was not begun because of the Braniff charges and is not related to the probe of the Texas grand jury.

He said the preliminary investigation could conceivably lead to criminal charges against any airline found to have violated antitrust laws through its operations of reservation systems. A more likely outcome of such findings would be to reach an out-of-court consent decree with the offending airline to halt the contested practices, he said.

The investigation is being conducted to see if there are any violations of the Sherman Antitrust Act, which prohibits restraint of trade through conspiracy or collusion and prohibits conduct that abuses monopolistic power. In this case, the investigation would have been undertaken because a few airlines provide automated reservation systems for the entire air travel industry.

Although CAB cannot bring criminal charges in its investigation, agency spokesman Ted Lopatkiewicz noted that CAB has the authority to investigate unfair or deceptive trade practices in the industry. The CAB probe began in March and is under the direction of the agency's general counsel's office, he said.

Neither CAB nor the Justice Department would speculate on how long their investigations will take.

Correction

It was erroneously reported that the June 14 DSS-82 conference on decision support systems is being sponsored by Execucom Systems Corp. [CW, May 17]. The conference is actually being sponsored by the DSS-82 Executive Committee. More information on the conference is available from DSS-82, Room 405, 146 Westminster St., Providence, R.I. 02903.

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HP, Pansophic, Chromatics Nix NCC Presence

The National Computer Conference may be the hottest DP show of the year, but certain vendors have decided to call it quits with the behemoth exposition.

NCC 1982 will mark Hewlett-Packard Co.'s final withdrawal from the show. Last year the company exhibited only its personal computer line, having ceased showing its technical business products and high-end systems two years ago, a spokesman said.

"The kind of dollars it takes to exhibit at NCC can be better spent elsewhere," the spokesman said, noting it can cost a company of HP's size close to $500,000 to attend NCC. "We won't be there in any way, shape or form — not even a hospitality suite."

HP is using the money it formerly spent at NCC for its own trade shows called Productivity '82. Currently, the company has scheduled nine shows for this year's circuit.

While many large hardware firms are not expected to withdraw from NCC, the story is different for smaller, more specialized companies. This year Pansophic Systems, Inc. will not attend NCC, as it has for the past several years.

"The DP industry is so large and segmented we felt we were lost in the shuffle," noted Debbie Pennings, the firm's marketing communications manager.

Pennings contended that NCC attendees are primarily interested in learning about products with new technologies such as personal computers.

Predicting a move to smaller shows, Chromatics, Inc. has also decided not to participate in NCC this year. "NCC has become a forum for large companies to show rather common technology to each other in overdone surroundings," charged Terry Hughey, the firm's chairman. "[NCC] fails to meet its primary purpose — exposing new companies and new technologies to prospective customers."

Hughey said the sales generated from NCC did not justify the expenses outlayed in past years. This year Chromatics will concentrate on smaller graphics-related shows such as the National Computer Graphics Association and the Association for Computing Machinery's Special Interest Group on Computer Graphics exhibit.

AWC to Hold First Conference Day Before NCC

HOUSTON — The Association for Women in Computing (AWC) will hold its first annual conference here on June 6, the day before the National Computer Conference officially begins in the same city.

The half-day conference, which will be held at the Downtown Sheraton, will begin at 1 p.m. with a planning session and annual membership meeting, which the public can attend by paying the registration fee.

A highlight of the conference will be the AWC's first award for contributions to the computing industry. It will be presented to Thelma Estrin, the recently elected executive vice-president of the Institute of Electrical and Electronic Engineers.

The conference will include sessions dealing with technical and management subjects, as well as information on the setting up and running of chapters. In addition, the announcement of the results of the organization's recent elections also will be made at the opening plenary session.

The conference fee is $15 for AWC members and $20 for nonmembers. Further information can be obtained from Dr. Elisabeth Mullen, JEM Associates, 459 Carlisle Drive, Herndon, Va. 22070.

WIP Seminar Set During NCC

WASHINGTON, D.C. — Women in Information Processing (WIP) has scheduled a seminar for Tuesday night during National Computer Conference week.

The Houston Forum — which will be held at the Astro Village Holiday Inn — will begin with a pool-side reception at 5:30 p.m. Its theme is "Views from the Top: The Shape of Things to Come."

Speakers will include Jon Shirley, vice-president for computer merchandising at Tandy Corp.; Leslie Vadasz, senior vice-president of Intel Corp.; Ben Dyer, president of Peachtree Software, Inc.; and Tom O'Mara, manager of office products, advertising, for the *Wall Street Journal*.

The registration fee for members is $12; for nonmembers it is $25.

Further information and registration materials can be from WIP, Suite 9, 1000 Connecticut Ave. N.W., Washington, D.C. 20036.

Mail Standard Under Way

(Continued from Page 1)

Office Systems program at NBS. Only a minimal amount of bureaucratic red tape remains to be cleared away before it is submitted to Secretary of Commerce Malcom Baldridge for official recognition. She expects no resistance from Baldridge.

The NBS Specification for Message Format for Computer-Based Message Systems has avoided the quagmire of controversy associated with other standards because it describes a format rather than protocols, Watkins said.

"It's something that can be handled by a translator before a message system turns a message over to a network," Watkins said in an interview. "In other words, you don't have to go in and change your system."

The standard addresses the issues of form and meaning of messages when sent from one computer-based message system to another. It does not stipulate how messages are displayed or manipulated by users or how messages are sent from one computer to another.

In a show of unity, companies that plan to adopt the standard said so in a joint announcement. These firms and their respective products include: BBN Information Management Corp.'s InfoMail; Computer Corp. of America's (CCA) Comet; Dialcom, Inc.'s Intercomm; Digital Equipment Corp.'s Decmail; GTE Telenet Communications Corp.'s Telemail; and Tymnet, Inc.'s Ontyme.

The question of how messages are sent from one computer to another is the focal point of the local-area network brouhaha. However, in the case of electronic mail (see related story), that battle may never take place, according to some experts.

Jim Norgaard, director of Office Products at CCA, is among that cautiously optimistic group. He said CCA technical people have looked at early work on the transfer protocol and come away satisfied.

Rob Elmore, product marketing manager of Ontyme at Tymnet, Inc., ventured a more reserved opinion. "The work I have seen so far has been too preliminary to identify as basic a division as baseband vs. broadband," he said. Asked if there is a war over the transfer protocol on the horizon, he replied, "I don't see it as a war, I see it as something that benefits everybody." He was optimistic because work on the transfer protocol has begun so early.

The product marketing manager said the only possible transfer protocol model at this point is Arpanet, the packet-switched network sponsored by the U.S. Department of Defense, which is used for most electronic mail supporting U.S. computing research.

Both Norgaard and Elmore said it is not likely any of the leading electronic mail suppliers would try or be able to exert enough muscle to dominate the creation of the transfer protocol.

They offered differing opinions on the effects a comprehensive standard might have on the electronic mail industry. Norgaard noted that within five years, fully compatible systems could threaten to displace telex communications in Europe and possibly later in the U.S.

According to Elmore, "It gives us the opportunity to really significantly compete with the postal service." He said he was not thinking of the recently implemented Electronic Computer-Originated Mail because that service features physical delivery from the post office to the recipient.

No matter where the future of electronic mail lies, both men agreed standards are a critical development.

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Two Vendors Working on It

Baseband-Broadband Tie Under Development

By Bruce Hoard
CW Staff

CUPERTINO, Calif. — What may be the first gateway between the previously incompatible baseband and broadband local-area networking technologies is being developed here.

Sytek, Inc. and Bridge Communications, Inc. have signed an agreement whereby Bridge will develop a product that performs protocol translation between Xerox Corp.'s baseband Ethernet and Sytek's broadband Localnet Model 40. The product will be marketed simultaneously by both companies.

Proponents of both technologies see the development as a de-escalation of the war of words that has engulfed them in recent months.

The gateway is actually three pieces of hardware: a Localnet interface, an Ethernet interface and a protocol converter sitting between them, according to Sytek President Michael Pleiner, who pointed out that the gateway will not enable an Ethernet to carry voice or video transmission. "You will not be able to export all of the services of broadband onto Ethernet, but the idea is you will support data services that are compatible with the Ethernet," Pleiner said in an interview.

Sytek is supporting the project because it wants to make its network accessible to the burgeoning number of office products being offered by Xerox. Pleiner listed the Star executive workstation and file and print servers as examples.

Sytek's customers have expressed a "reasonable" amount of demand for the gateway, Pleiner said, adding that it will be particularly appropriate for users with extensive broadband networks that wish to access isolated Ethernets. "The idea is to export services, not restrict them," he observed.

Several beta test sites are under consideration. The final product, which Pleiner said will cost in the neighborhood of $25,000, is slated for delivery during the first or second quarter of 1983.

Asked if development of the gateway is an admission that both baseband and broadband technologies are here to stay, Pleiner replied, "I think it's reasonable to say that there will be Ethernet devices in the future. We feel if we close our minds to that . . . we're not providing a true networking service."

But Paul J. Severino, president of Interlan, Inc., a manufacturer of Ethernet-compatible products, was quick to see the gateway as an endorsement for the baseband camp: "Ethernet is becoming the de facto standard. Sytek obviously is selling into the local-area network environment and finding there are applications where baseband is more effective than broadband."

Trio Indicted For Embezzling

(Continued from Page 1)

and Alan L. Gieseman of Joppa, Md.

Hired by the hospital in January 1979, Slear is charged with accepting bribes from Gieseman and Boyle from February 1980 to March 1981. He allegedly accepted $41,095 in cash and merchandise, including a $2,555 grandfather clock, from Gieseman. The bribes are said to have been in connection with a $60,000 contract for computer-related services awarded to Gieseman's firm.

Boyle, hired in 1979 to help set up the hospital's accounts receivable and billing systems, allegedly conspired with Slear to steal the $126,564 through a scheme to submit false invoices to the hospital for software and services. Slear reportedly approved payment for those invoices and then received most of that money in kickbacks from Boyle.

According to the Maryland Attorney General's Office, which investigated the charges, Slear had been convicted in 1973 in Baltimore County on embezzlement charges. University officials said Slear's professional references were checked when he was considered for employment, but no effort was made to see if he had a criminal record.

The same failure to conduct a security check led to the employment in 1980 of a hospital computer operator, Barry Wyche, who last year was convicted of embezzling almost $40,000 by submitting false invoices to the hospital's computer system. At the time, Wyche was on probation for a similar offense [CW, April 13, 1981].

Wyche was arrested just one week before Coopers and Lybrand's audit began. Hospital officials said last week that Slear had delayed that audit for nine months, apparently fearing it would uncover the billing irregularities that led to his indictment.

The hospital said it has since started requiring background security investigations for persons seeking employment in "sensitive positions" and has tightened controls on its financial systems.

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Wang Adds Disk Drive, Tape Backup, Software

By Bruce Hoard
CW Staff

LOWELL, Mass. — In addition to introducing a personal computer and new VS systems here last week, Wang Laboratories, Inc. also unveiled a 640M-byte disk drive, a ¼-in. tape cartridge backup device and two software packages for VS computer system users.

The 640M-byte Model 2265V-3 disk drive is said to be compatible with Wang VS 45, 80, 90 and 100 systems. It provides support for larger applications programs and more data, a spokesman said.

Performance characteristics reportedly include an average transfer rate of 1.2M bit/sec and average seek time of 25 msec.

The drive's use on the VS 45 requires a disk device controller, which is available in four models supporting one to four ports. The VS 80, 90 and 100 must be configured with a new I/O processor, which also comes in four models, supporting one to four ports.

At the entry level, the VS 45 — when configured at a maximum with the Model 25V50-4 disk device controller — supports four drives for a total storage capacity of 2.56G bytes. The 25V50-4 costs $5,000.

At the high end, the VS 100 — when configured with the maximum of four Model 22V88-4 I/O processors — supports 16 devices for a total storage capacity of 10.24G bytes. Each 22V88-4 costs $22,500.

Available in December, the Model 2265V-3 disk drive costs $38,000 with a monthly maintenance fee of $253.

Tape Cartridge Backup Device

The tape cartridge backup device was designed to provide a removable media backup device for Wang's 16M- to 34M-byte fixed disk drive. It runs on the OIS and Alliance systems, the VS 25 and 45 and the 2200 LVP and MVP.

It is a 4-track, 6,400 bit/in., system that includes both the controller and tape drive.

The tape cartridge costs $6,000 and will be available in December.

Also introduced by Wang were Ezquery and VS Info, two software packages designed to increase the productivity of VS computer systems. Ezquery is an interactive relational query language that provides the VS user with a method of retrieving and updating data without knowledge of either programming or the internal structure of the data base, Wang claimed.

Phase One of Ezquery costs $1,500 for VS 25, 45, 50 and 80 systems and $2,000 for VS 90 and 100 systems. It will be available in July. Phase Two will be available in January at a cost of $3,000 for the low-end VS systems and $4,000 for the high-end group.

VS Info is an on-line help and information facility. It permits VS system users to access Help text information for new and future interactive Wang VS software products.

In addition, VS users can order an on-line version of VS reference manuals and reference them utilizing a set of comprehensive searching techniques. There will be no charge for VS Info. However, each of the VS systems reference manuals providing specific language formats for VS Info must be ordered as separate products, costing $250 each. There is also a monthly maintenance charge of $15.

Wang is located at One Industrial Ave., Lowell, Mass. 01851.

Wang Unveils Entry-Level VS Systems

(Continued from Page 1)

storage and up to four optional communications controllers.

The second entry-level system introduced, the VS 45, includes the 1.2M-byte DSDD diskette drive and a 32-port serial device controller capable of supporting up to 20 workstations. It can be configured with 256K to 1.2M bytes of main memory.

The VS 45 can also have a 34M- or 68M-byte fixed-disk drive and/or optional disk service controllers capable of supporting up to four 30M-, 60M-, 75M-, 90M-, 288M- or 640M-byte external disk drives and up to four optional communications controllers.

Both systems include:

- A 16-bit CPU with 32-bit data paths.
- 64K-byte random-access memory chips.
- Software compatibility with the entire VS product line.

A typical VS 25 costs $25,000; it will be available this July. A typical VS 45 costs $28,000 and will be available in September.

Graphics Workstation

The Model 6300 graphics workstation runs on Wang's OIS and VS devices, supporting DP, WP and graphics.

Two graphics software packages were announced with the Model 6300: the Wang Charter and the VS Graphics Facility. Charter is for the OIS Models 115-4, 140 and 145 and any VS models with word processing. The Graphics Facility is for the VS 25, 45, 90 and 100 models used in a DP mode.

The Model 6300 costs $5,985, the Charter software, $2,000 and the VS Graphics Facility, $3,000. There is also a $5,975 high-density matrix printer for black-and-white graphics output. All will be available in the fourth quarter of this year.

Enhancements to the 2200 minicomputer series include a new workstation, a dual-workstation SVP system and an intelligent workstation processor. The Model 2336DW supports both data and word processing while allowing users to interact compatibly with all current 2200 series systems. Available in July, the 2336DW costs $2,200.

The Option-W workstation processor for 2200 SVPs allows a second workstation to be added to the SVP. Available in July, it costs $1,000.

The new 223MXE four-port workstation for LVPs and MVPs features a time-of-day clock, an asynchronous communications controller with software-selectable transmission rates, software-selectable ports and intelligence to control up to four local or remote workstations. Available in July, it costs $1,400.

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Personal Computer Bows

(Continued from Page 1)

pilers

The PC-Word Processing package features Microsoft's Multiplan electronic spreadsheet. Microsoft will also provide its enhanced graphics Basic-86 interpreter.

Wang stressed the modular nature of the Professional Computer, saying it can be configured as a basic off-the-shelf system with the electronics enclosure and detachable keyboard or expanded with optional displays or home connection, printers and diskette or Winchester disk storage devices. A CRT monitor and accompanying adapter are optional.

Based on the Intel Corp. 8086 microprocessor and utilizing a full 16-bit architecture, the personal computer comes with 128K bytes of parity-checked memory (expandable to 640K bytes) for user programs and an RS-232C asynchronous interface that supports both serial devices and communications. There is also a Centronics Data Computer Corp.-compatible parallel printer interface and a standard 320K-byte, 5¼-in. floppy diskette drive.

Optional output devices include a 20 char./sec daisywheel printer and an 80 char./sec dot-matrix printer

Optional communications software includes asynchronous communications support for teletypewriter protocols and Wang 2200 workstation emulation. As an asynchronous or synchronous DP workstation on the 2200 or VS, the Professional Computer supports both batch and interactive communications protocols, including IBM 3270, 2780/3780 and Systems Network Architecture.

It also supports the X.25 packet-switched and X.21 protocols in addition to teletex.

Price Range

The price range of the Professional Computer, which will be available this fall, runs from $2,695 to $8,945. The Multiplan spreadsheet costs $300 and the word processing package costs $500.

The CRT monitor costs $350 and requires a $350 adapter. The remote communications option costs $1,500, the local communications option is priced at $2,000 and the CP/M 80 emulator card costs $1,000, the vendor said.

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DOS: 16 chapters, 407 pages, $22.50
OS: 16 chapters, 450 pages, $22.50

Structured ANS COBOL Part 1: A Course for Novices

Designed for the complete beginner, this book starts off by providing the minimum hardware and software background a beginner must have before learning how to program. It then teaches a professional subset of COBOL...a subset that includes sequential file handling on tape and direct-access devices. What's more, it teaches how to develop (design, document, code, test, and debug) *structured* programs as it teaches the COBOL language. So it gets the beginner writing structured programs right away.

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Baxter Sees AT&T Service Monopoly Withering

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Long-distance communications services are currently competitive among all of the nation's major cities, and the remainder of AT&T's interexchange service monopoly will wither away during the next five to six years, Assistant Attorney General William F. Baxter said here last week.

Baxter's comments were made in reply to questions posed shortly after he addressed a meeting of the Federal Bar Association. The questions were inspired by the assistant attorney general's statement during his speech that competing equipment suppliers and on-line information providers oppose the proposed settlement of the government's antitrust suit against AT&T because it fails to separate the phone company's Long Lines Division from the rest of the undivested Bell system.

Critics of the settlement fear that revenues earned by Long Lines will unfairly cross-subsidize AT&T's competitive activities. Baxter, however, argued that because of increasing competition, AT&T cannot charge excess prices for its long-distance services without losing substantial market share.

He contended that in the "last few years," the communications traffic carried by other common carriers — such as MCI Communications Corp., Southern Pacific Communications Co. and Satellite Business Systems — has doubled and that this trend will continue.

But one of the other speakers at the seminar, Stephanie Biddle, vice-president of the Computer and Communications Industry Association, which represents many of AT&T's present and prospective competitors, responded that it has "taken 10 years for the specialized carriers to gain a 3% share of the long-distance market."

Michael Senkowski, an attorney for several independent suppliers and large corporate telecommunications users, added that AT&T's own figures project only a modest drop in its present 96% share of the long-distance market during the '80s.

State Regulators

While the phone company's competitors represent one major source of opposition to the settlement, state regulators represent the other, according to Baxter. They are worried that the settlement will leave the Bell operating companies too weak to survive because of the restrictions placed on their activities, Baxter said. He added, however, that the regulators are motivated by politics rather than economics.

The settlement, he pointed out, allows regulators to continue subsidizing local rates through exchange access charges — the fees paid by MCI and other common carriers as well as AT&T Long Lines for use of local exchange facilities.

But since the access charging scheme to be implemented as a result of the settlement is "more visible" than the present separations and settlements process, state regulators will become "more politically accountable" — more open to criticism from long-distance carriers and presumably business telecommunications users, who will have to pay the bulk of these higher charges.

'Ludicrous' Fears

One of Baxter's underlying points was that local-exchange services today are priced far below their true costs; therefore, fears that the Bell operating companies will go broke after divestiture are "ludicrous." Even if their costs were tripled, the Bell operating companies would remain viable, the assistant attorney general said, because "there is enough room under the demand curve" to raise prices a like amount without reducing the customer base.

Henry Geller, then-President Carter's chief telecommunications adviser, agreed with Baxter that the Bell operating companies are not likely to be bankrupted by the proposed settlement of the government's antitrust case. Geller insisted, however, that failure to let the Bell operating companies offer more than basic exchange services is a serious error.

It will reduce competition in the enhanced services market, he said, and possibly even more important it will lead to endless arguments over the definition of "local-exchange service," resulting in further delay in the introduction of new services and equipment.

State regulators, Geller pointed out, will want to let the Bell operating companies exploit new technology as a way of expanding their revenues and reducing the need for rate increases. But if Bell operating companies remain limited to local exchange and exchange access services, the regulators will have to find ways of defining the new offerings so they can be encompassed within the Bell operating companies' charter.

Suppliers of those products and services will almost certainly object, resulting in the same sort of protracted lawyers' battle that has occurred at the Federal Communications Commission in connection with the Computer Inquiry II proceeding. One result of that latter battle, Geller pointed out, was that AT&T's introduction of the Dataspeed 40 terminal family was delayed for four years.

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Sense of False Security Cited

Spies Seen Penetrating Corporate Centers

By Bob Johnson
CW New York Bureau

ARLINGTON, Texas — Industrial espionage and DP spies or "penetrators" are focusing on corporate computer centers, according to James G. Lightburn, vice-president of Total Assets Protection, Inc. (TAP), a Texas-based information security and recovery firm.

"Industrial espionage does exist, and it is growing in the DP field at an increasing rate. Now that the recession has slowed the economy, more companies are becoming targets for this type of crime. If the market value of sensitive information exceeds the cost/risk factor of stealing it and being punished, a company could become a target for espionage or employee fraud," he said.

Lightburn explained that there are two basic types of industrial espionage DPers should be aware of. One is passive — the collection of data — and the other is active — where information is used to modify, change or destroy data that was not accessible without first stealing access codes or passwords.

The security expert said that the computer has become both a tool and a target for the "industrial spook." "Since most information, sensitive or not, flows through or is stored in the computer, it is a logical target for penetration by industrial spies," Lightburn said. He cautioned that senior management is often guilty of misconceptions about the possibilities of using the computer as a tool to acquire a company's secrets.

"There is a serious sense of false security in most corporations today. Many companies feel secure because they have purchased a software security program to limit the access to data and provide audit trails," Lightburn said. He revealed, however, that senior management has not been educated about the total scope of the security issue and is in fact vulnerable to DP "spooks."

"Managers spend a lot of time and money to purchase and install this kind of security, but the problem is that it is still easy to steal any information a thief wishes even with a security package in place." He pointed out that a penetrator can tap into a system at one of many "appearance points" and view all of a system's data traffic. He said, as an example, "I can go out and play golf and come back after the game and have as much information on hard copy about any system I want."

Lightburn stated that some managers are confused as to what is fact and what is fantasy when it comes to stealing data. He said that many DPers erroneously think that data transmitted in digital form is more secure than information transmitted via voice communications. Similarly, they think wiretapping is difficult and expensive and corporate espionage will only happen to "the other guy and not me."

According to the vice-president, most information systems can be compromised by penetrators for less than $1,000 in equipment. Lightburn offered the following description of some espionage techniques:

- Eavesdropping: A passive form of data theft that listens or records conversations and data communications on data lines or satellite and microwave transmissions.
- Masquerading: The use of authorized system access codes or passwords by unauthorized individuals.
- Piggybacking: A penetrator inserts a terminal into a communications line and intercepts communications between the user and host system, allowing him to modify or replace data.
- Between the lines: The penetrator utilizes unused communications lines.
- Line grabbing: The penetrator intercepts an authorized sign-off signal on a communications line and then transmits the expected sign-off received message from the host computer. The authorized line is then available for access at the penetrator's discretion.

There are countermeasures, Lightburn said, but he noted that the solution to the problem is complex.

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Cbema Endorses H.R. 5158

WASHINGTON, D.C. — Passage of the controversial telecommunications bill now pending before the House of Representatives Commerce Committee has been endorsed by the Computer and Business Equipment Manufacturers Association (Cbema).

In letters to members of the committee, the association said the bill, H.R. 5158, is desirable because it establishes a policy of relying on competition rather than regulation for provision of telecommunications equipment and services.

In addition, Cbema said, the bill implements the policy by beginning the deregulatory process and provides safeguards against potential anticompetitive behavior by "presently regulated monopolies."

Courts 'Century and Half Behind' DP Crime

By Jim Bartimo
CW Staff

WASHINGTON, D.C. — Not only are law enforcement agencies poorly trained to nab perpetrators of computer-based crime (see story on Page 13), but the courts are not very good at prosecuting them, an attorney here specializing in technology charged.

"We have a criminal justice system whose structure is antiquated," charged August Bequai in a recent interview. "If you look at statistics, you'll see that the guy who robs a bank and gets away with $5,000 will get punished more harshly than someone who embezzles half a million dollars worth of data.

"We don't punish people by how much they steal, but how they steal it," he said.

'A Century and a Half Behind'

Calling the structure of the U.S. justice system "a century and a half" behind the computer criminal, the lawyer also pointed to loopholes in the law that force cases to become time-consuming and costly. Due to the complex nature of modern technology, several prosecutors may be hired for research purposes at even greater cost, he said. "Sometimes, the prosecution will drop the case before it even goes to trial, because they know it could drag on for six or seven years and the guy will only get a slap on the wrist," he said.

Another problem facing the justice system arises when computer crime is not reported. A bank has obvious reasons for not reporting a loss of funds, but Bequai said that many government agencies and large corporations also do not report the crime to avoid embarrassment.

When the crime is reported, it may be mishandled by the law enforcement agency. "A client of mine got taken [by a computer scam] and took the case to the police. They bungled it so badly that they couldn't prosecute," Bequai said. "The victims don't have much faith in the ability of the system to prosecute and they're right to feel that way."

Bequai offers the same solution to the computer crime problem as does Leonard Gilbert of Coopers and Lybrand, a certified public accountant firm, and Bernard Grant, senior data security auditor for General Electric Information Systems Co.

"Computer people are going to have to learn more about the justice system. If the computer industry expects the criminal justice system to reform on its own, I wish it good luck," Bequai said.

SBS Planning Nonswitched Net For Next Year

MCLEAN, Va. — Satellite Business Systems (SBS) said it will introduce a nonswitched data communications service during the first quarter of next year for the user who does not need the much larger capacity of its Communications Network Service (CNS).

The new offering, the Data Network Service (DNS), will be provided through a dedicated SBS satellite transponder and will utilize frequency-divided channels, each having a maximum capacity of 3M bit/sec. This capacity will be time-shared among DNS users, who will be offered simplex or duplex service at speeds ranging from 56K to 1.5M bit/sec.

The company expects DNS to be used for data transmission, electronic document distribution and video teleconferencing.

The DNS earth station will consist of a radio frequency terminal with a 3.6- or 4.7-meter antenna and time-division multiple-access controllers. Because of the earth station's lower cost, DNS rates will be lower than those for comparable CNS channels, SBS said.

DNS, like CNS, will utilize the 14 GHz and 12 GHz band, permitting the earth stations to be placed in urban areas without risking interference, the company added. Although not switched, DNS channels will be dynamically reconfigurable.

Service charges will be based on full-period leases and will vary according to the number of earth stations used as well as the amount of full-time transmission capacity ordered.

GTE Telenet Sets Discount

WASHINGTON, D.C. — Customers of GTE Telenet Communications Corp. can cut their fixed monthly service charges by 10% under a tariff amendment the company has submitted to the Federal Communications Commission. The tariff will become effective June 1 unless the commission objects.

To obtain a 10% discount, the customer must lease an interface, an access line or access port facilities for two years. The customer will receive a 5% discount by signing up for one year.

In addition, rates for GTE Telenet's night-time service between 6 p.m. and 9 a.m. weekdays, plus weekends and holidays, were reduced 50%.

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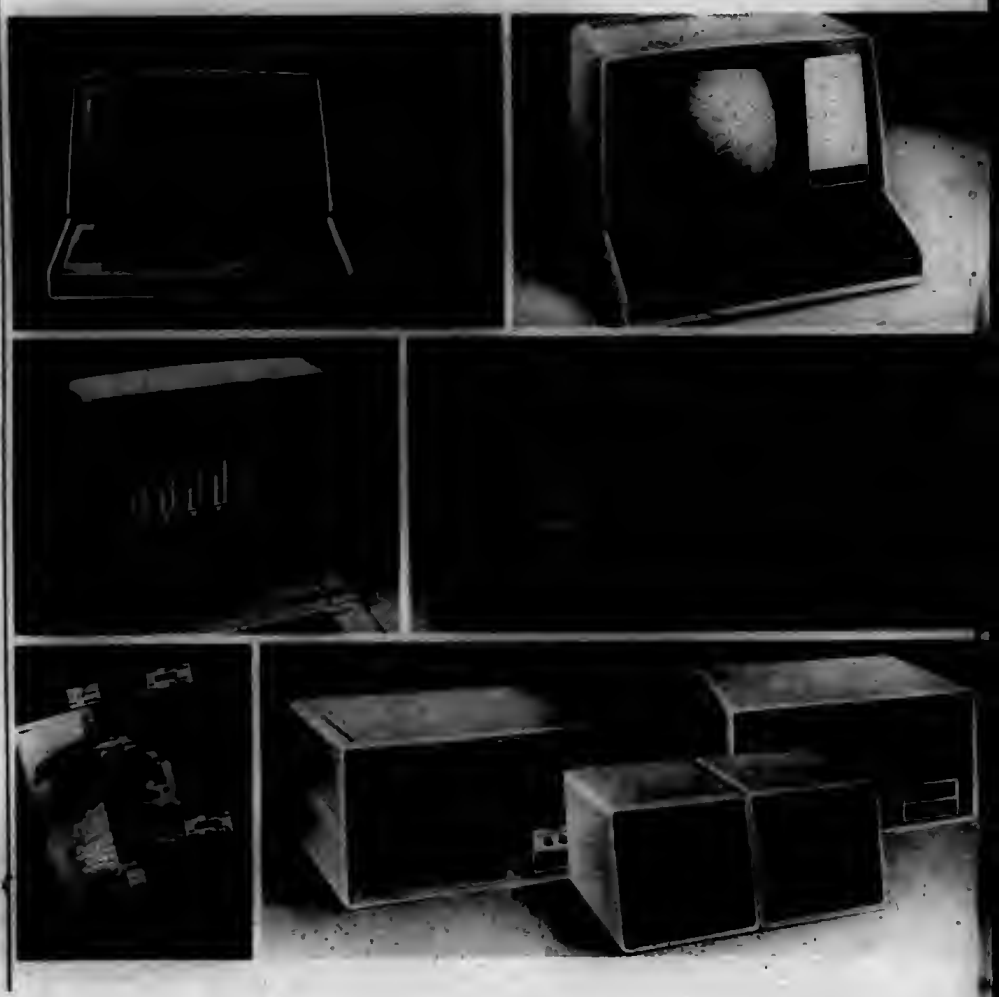

Police Agencies Undertrained

Expert Says System Manager Must Police DP

By Jim Bartimo
CW Staff

Bonnie and Clyde had one technological advantage over the police — they used cars and the police used horses. That gap in technology is analogous to the one that exists today between computer criminals and law enforcement agencies, according to a data security expert.

Only "20% to 35% of the [Federal Bureau of Investigation's] agents are trained for investigating computer crime," Bernard Grant, senior data security auditor for General Electric Information Systems Co. in Rockville, Md., pointed out. If the largest police agency in the country employs such a smaller percentage of trained computer crime experts, imagine how little DP expertise can be found in police departments located in smaller cities, he suggested.

The FBI predicted in 1980 that computer crime would rise by 127% in 1981, Grant said, and that figure proved to be accurate.

If the police are so strapped for DP expertise and if DP crime is on the rise, deterrence is best located at the source — the computer site, according to Grant, who urged that one person be appointed responsible for computer system security.

That person should understand the potential for crime, be able to express the problem in simple terms to investigators and have a working relationship with both management and technical personnel.

Who should that person be? "There is only one person who can do all things," Grant said. "The system manager."

Six Vulnerable Areas

Grant sees "a day when there will be whole teams of people monitoring the system," but until then, where does the system manager begin? Leonard Gilbert of Coopers and Lybrand in Miami, a certified public accounting firm, identified six areas of vulnerability in any large computer installation:

- **Operating Systems**: "People in the data processing department usually don't understand the operating system," Gilbert said. "You get a technical person and he can bypass the OS by using assembler code or machine language. He comes in through the back door."
- **Passwords**: This is the most vulnerable area, according to Gilbert. A criminal can change, extract or input data with the use of the stolen password. And passwords are usually not well guarded, he said. "In many banks, the passwords are just lying around on someone's desk."
- **Disk Storage**: Like passwords, disks that store information are often not well guarded. "You could simply alter or copy them," Gilbert said.
- **Programs**: Most programs have no built-in safeguards against alteration, Gilbert said.
- **Distributed Data Processing/Telecommunications**: Gilbert said that a criminal can easily visit an authorized remote computing site and watch how the system works. Then the culprit can wiretap the system and emulate the authorized users he has studied.

One instance of this type of computer crime came from a Japanese National Police Agency report describing a communications whiz who tapped into the Nippon Telegraph and Telephone Public Corp. to attain account numbers from banks using the lines for data communications. The result of his efforts was $500,000.

- **End Users**: "Most statistics show that DP people do not commit computer crime — it's the end users," Gilbert said. Assuming that these statistics do not simply reflect that end users just get caught more often, it behooves the system manager to guard the end user more closely, he noted.

A legal complaint, for example, was filed in Minnesota by Magnetic Peripherals, Inc., a Control Data Corp. subsidiary that lost $155,000 to an end user who manipulated the accounts payable system into thinking she was a vendor in need of payment.

Court Appearances

Not only will the system manager be in charge of crime prevention, but it will also be his duty to appear in court when a criminal is being prosecuted, Grant noted.

The system manager must be able to verify a crime, know what kind of audit agency to contact for help and assist in the reestablishment of system security once a crime has been committed. According to Grant, 99% of these problems are not crimes of technology, but of internal procedure.

Gilbert agreed that internal precautions are necessary. He suggested "smart programs," that is, software with functions programmed into them that will tip off the DP head when a crime or a potential crime is in the works. "If someone tries a password more than twice and doesn't get it, that should show up on the supervisor's terminal."

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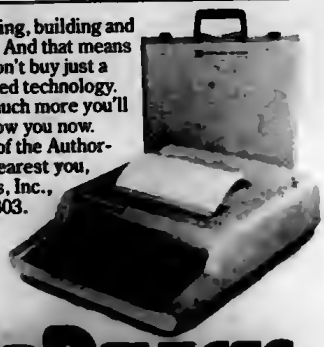

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When Are Four Cray-1s Just Not Enough?

Los Alamos Photo by Fred Hick

Magnetic Tape Files in Los Alamos National Laboratory's Computing Division

By Jake Kirchner
CW Washington Bureau

LOS ALAMOS, N.M. — What does a DP facility do when hundreds of millions of dollars worth of the most powerful supercomputers ever built is not sufficient for its needs?

For the central computing facility at Los Alamos Scientific Laboratory here the answer was simple. It will soon install its fifth Cray Research, Inc. Cray-1 system and is accelerating its research and development work on future generations of supercomputer architectures.

The facility supports the work of 7,000 laboratory scientists and technicians, whose work in nuclear weapons and energy has made the name of Los Alamos synonymous with the Atomic Age. Just as the laboratory is a living legacy and tribute to Robert Oppenheimer and his fellow scientists who came here 40 years ago to launch the effort leading to the detonation of the first fusion and fission warheads, the computing facility here is a kind of monument to Seymour Cray.

His first Cray-1 computer is here, still in operation, as are a half dozen of its predecessor large-scale scientific processors, the Control Data Corp. CDC 6600 and 7600 machines also designed by Cray with the cooperation of Los Alamos. And the computing staff here is already speaking familiarly of the most recently announced Cray product, the Cray X-MP, which will reportedly provide a 500% throughput improvement over the current machines.

Power Needs High

But research and development on the lab's plethora of defense projects — everything from laser weapons and cruise missiles to the Pershing, Trident and MX systems — and nuclear energy programs require considerable computing power. This is computer power the Department of Energy, which owns the lab (although it is run by the University of California), must have.

"The public does not want reactor safety explored empirically," Bill Buzbee, head of research at the computing facility, remarked earlier this month during a rare press tour of the laboratory.

The computer models that make possible those defense and energy programs eat up huge amounts of computer time, he noted. Even five Cray-1s can be consumed by such applications, many of which require hundreds of hours of processor time at a stretch. Computing director Robert Ewald said the lab's scientists could easily use 100 times the power of a Cray-1.

Growth Rate Slowing

Unfortunately, "the growth rate in computer performance is diminishing," Buzbee said. And even with the incorporation of such advanced technology as Josephson junctions, the best that can be expected in this decade is a speed improvement by a factor of 10.

Buzbee and Ewald show considerable interest in the current Japanese effort to develop a supercomputer and a fifth-generation general-purpose computer.

Ewald said of a recent visit to Japanese manufacturers, "I came back from that trip as more of a believer than I had been before the trip." The Japanese goals are ambitious, he said, but given the money and the sizable effort they are expending, he believes "They are going to get something out of [those projects].

"Big science requires big computing," he said, explaining the lab will probably have to buy the best machines available no matter who produces them. But, he continued, "we're a national laboratory working on national problems." Continued access to the latest machines is essential, Ewald contended, meaning the U.S. "must remain the leader in the supercomputer industry."

(Continued on Page 16)

Top-Secret Nuclear Lab Determined to Cut DP Staff, Increase Computing Power

By Jake Kirchner
CW Washington Bureau

LOS ALAMOS, N.M. — The Los Alamos Scientific Laboratory sits on a jagged string of mesas 7,000 feet high in the alternately barren and lush Jemez mountains. It's setting is appropriate for the rarified scientific atmosphere of the lab's top-secret nuclear weapons and energy programs.

The lab's central computing facility, fittingly state-of-the-art in the operations of its 100-mainframe scientific computing network, would, however, be surprisingly familiar to most personnel in any DP organization.

Although a Fortran heavy advanced supercomputer and communications operation, the DP center here is set up as a general-purpose computer center, albeit primarily for scientific, number-crunching applications. This arrangement was necessitated, according to Computing Division head Robert Ewald, by the large variety of research and development programs supported by the Los Alamos computers.

Recruiting Difficulties

Although the facility provides a challenging environment to DP professionals, Ewald said the lab has some recruiting difficulties. The facility attracts those DPers who like backpacking and skiing, do not mind supporting nuclear weapons research and who can pass rigid security clearance procedures, he said.

This type of worker is not necessarily a rare bird — the facility has approximately 325 persons on its DP staff — but is sufficiently hard to find and expensive to employ that the center has made it a priority to reduce personnel levels while simultaneously increasing computing power.

A measure of the center's success in reducing manpower requirements is that only 76 persons work in operations despite around-the-clock running of, among others, four Cray Research, Inc. Cray-1s; four Control Data Corp. CDC 7600s; some 50 Digital Equipment Corp. VAX-11/780s; and a central file system including 6 trillion bits.

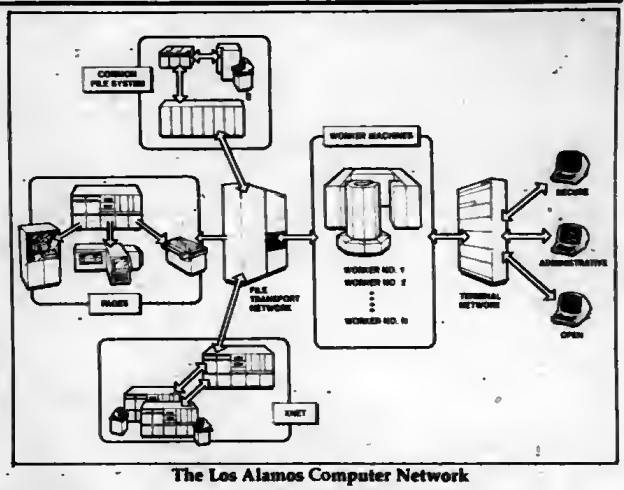
The allocation of staff resources also shows the center's commitment to offering services tailored to each of its 3,500 users. Approximately 100 computing facility employees in the research and applications and users services groups are supported by a like number in communications, network engineering, graphics and systems groups.

The large numbers of user services and network personnel are needed because the facility serves more than 44 square miles of laboratory buildings. The computer network is partitioned into three separate security levels: an open partition for nonrestricted work, an administrative network for sensitive data used by laboratory employees and a secure partition for classified research.

The classified partition is secured by dedicated lines governed by encryption equipment supplied by the National Security Agency. Network control functions are handled by Digital Equipment Corp. PDP-11s, which check passwords and allocate access to the various partitions of the network. The network — using VAX 11/780s for distributed processing and PDP/11s as terminal concentrators — has 1,500 ports, a growing number of them with 150K bit/sec transfer rate capability.

Network users are restricted by security clearance status to different

(Continued on Page 16)



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Lab's Net Expanding to Include Private Industry

By Jake Kirchner
CW Washington Bureau

LOS ALAMOS, N.M. — The Los Alamos National Laboratory's computing facility has long had widespread extended network operations. Using a combination of dial-up telephone, coaxial cable, optic fiber and satellite links, the DP center shares it capabilities with other Energy Department labs, various government agencies and universities.

Now the facility is expanding this program to foster joint research by Los Alamos scientists in collaboration with other institutions and private industry. The response so far? "The telephone has come off the hook," according to Dale Sparks, head of the facility's networking operations.

While the facility has much to offer scientific computing practitioners around the country, "we are not running a service bureau," Sparks emphasized. The lab expects to get as much as it gives, he said, and lab officials believe they have a lot to give.

The lab's central computing facility has developed high-speed parallel interfaces for its large variety of Cray Research, Inc., IBM Corp., Control Data Corp., Digital Equipment Corp. and Systems Engineering Laboratories, Inc. machinery.

The center is also pushing the state of the art in high-performance algorithms, multiprocessor operating systems, distributed computing, audio I/O, numerical techniques and benchmarking.

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Lab Cuts DP Staff, Adds Power

(Continued from Page 15)

types of "worker machines," but all have access to the facility's common file system (CFS), which is also security-partitioned. Besides the obvious delight the facility staff takes in operating a dozen supercomputers, the center's officials seem most proud of the CFS and its more than 6 trillion bits of storage, almost half of it on-line.

A hierarchical system, the CFS is based on an IBM 3850 mass storage device and an array of IBM 3350 disk drives, all controlled by two IBM 4341 mainframes. Programmed in PL/I, CFS operations depend on automatic migration of file storage from on-line to off-line to achieve a five-second average response time for 85% of all user requests.

The 6.2 trillion bits of current storage comprise 570,000 files. Growing at a yearly rate of 225,000 files (3 trillion bits), the system transfers some 17,000 files (60 billion bits) a day. Development of CFS has allowed the center to pare its 55,000 tape library to less than 17,000 tapes today.

The computing facility operates on a current annual budget of $33 million, but charges users for all access, storage, computer time and output. Center officials said they expect to double the number of users by 1990.

But division chief Ewald said the facility considers an equally valuable contribution will be in extending the facility's external network, to make Los Alamos one node in a national scientific computing network comprising other national laboratories, universities and private industry.

Lab to Install Fifth Cray-1

(Continued from Page 14)

He suggested the present supercomputer development work of the National Aeronautics and Space Administration (Nasa) will produce benefits for the entire computing industry, but he noted the Nasa R&D is directed at specialized applications and not general-purpose scientific computing.

Buzbee added that the Cray organization is steadily improving its products, but even the acknowledged leader in supercomputer technology does not foresee the kinds of performance gains the Los Alamos staff needs now. In addition, Buzbee said, development of each succeeding generation of a supercomputer family can cost as much as $100 million.

Taking a more positive attitude toward this problem, Ewald said he believes the growth in the supercomputer market, which he estimates currently calls for more than 200 Cray-type machines, and the Japanese push to develop new computer architectures, will persuade Congress to support U.S. supercomputer R&D more actively.

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By Jim Bartimo
CW Staff

WORCESTER, Mass. — The ability to speak well in public can be the most important factor in the career advancement of a DP manager, according to Stewart L. Stokes Jr., manager of educational programs for Q.E.D. Information Sciences, Inc., who recently conducted a workshop on "Effective Presentation of DP Projects and Proposals" at the New England Computer Conference.

"You know that one man or woman who you hired months ago that is already past you on the ladder?" Stokes asked. "You ask yourself, 'why?' — you say, 'I know more about project management, I know more about systems analysis.' The answer is that once your organization feels that they can put you out in public and say, 'Here's the ball, run with it,' your career is going to take off."

Effective speaking can also lead to a better relationship between management and the DP department, Stokes said. The most important aspect of a presentation is to answer the question, "What's in this for the audience?"

Three Major Factors

According to Stokes, there are three major factors a speaker must control in order to become effective. Whether that audience consists of the chairman of the board or a group of end users, the speaker must effectively deal with his mannerisms, his material and the reaction of the audience, Stokes said.

"Most DPers do pretty well with speeches to inform," Stokes said, "but they get into trouble when they have to speak in nontechnical terms and speak effectively." Stokes defines a speaker with verbal skills as one that can think, organize and speak. "Communication doesn't start when you open your mouth," he said.

"Only 7% of communication comes from the words, 93% comes from the music and the dance." The music and the dance are what Stokes refers to as nonverbal communication, or the physical presence of a speaker. According to Stokes, many speakers say that they are happy to be speaking, but act so uncomfortable that the audience knows this is not true.

Another problem DP professionals face is the tendency to overexplain their material and overlook the end results. Stokes said that three aspects of a DP project should be presented: features, functions and benefits. There is no point in explaining about bits and bytes if the listener doesn't know how they will affect him, Stokes explained.

Finally, a speaker must consider the reactions of the audience.

CW Photo by J. Bartimo

Stewart L. Stokes Jr.: "Communication doesn't start when you open your mouth."

Getting More DP For Fewer Bucks

At the same time that top management is expecting more and more from its DP department, there is also a drive to reduce costs. That means DP and management information systems managers are being asked to increase their companies' competitive edge to ensure more revenues and, at the same time, cut back on costs to ensure profitability.

The July 26 *Computerworld* special report, "More DP for the Dollar," will be geared toward helping DPers maximize productivity while saving money.

CW is looking for tutorials, studies, application stories and anything else that can help DP shops realize that elusive goal. Possible topics include the pros and cons of third-party maintenance and leasing, service bureaus vs. in-house computers and micrographics vs. optical disks.

You could also write on how to select consultants, service bureaus and computers. Or you might explore the pros and cons of going with contract programmers.

Send responses in the form of four to eight typed, double-spaced pages to Bruce Hoard or Marguerite Zientara at *Computerworld*, Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701. The deadline is June 15.

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Because of U.S. vs. AT&T Settlement

Communications Users Told Changes Needed

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Settlement of the AT&T antitrust case will require telecommunications users to make several major changes in their present operations, according to Robert E. Bennis, telecommunications director at Westinghouse Electric Corp.

While there will be more competition, there will also be more "new and untested" vendors, he pointed out. Firms that lack the huge financial resources of AT&T will require more up-front money from the buyer, he said.

Bennis spoke here recently at a two-day seminar sponsored by Telestrategies, Inc., a McLean, Va., consulting firm.

There will also be more choice regarding product features and network architectures, Bennis said, but pricing of components will be more complex, and the user who wants to exploit the new freedom will have to provide more of his own design and engineering support.

More Maintenance

Maintenance is also likely to become more involved. The single point of contact will disappear even for those who continue dealing exclusively with the Bell system.

Meanwhile, rates, especially for short-haul circuits, will increase substantially, according to Bennis.

Another speaker at the conference, Walter Bolter, chief economist of the House Telecommunications Subcommittee, disagreed with both the Department of Justice and AT&T about the effect of the settlement on local rates.

The government and the phone company have said repeatedly that local rates will go up during the next several years due to inflation and Federal Communications Commission (FCC) policies rather than because of the settlement.

Bolter, however, insisted that the settlement will probably cause a precipitous rise in local rates.

Among other expenses now on the books of the Bell operating companies, he pointed out, are deferred tax liabilities of $14 million, unamortized taxes of $6.544 million and pension and death benefits of $31 million. If AT&T does not pay enough for the Bell operating company assets it will get as a result of the settlement, the operating companies will seek rate increases from their state public utilities commissions, Bolter explained.

He added that the Bell operating companies will have no choice since, under the settlement, their revenue-earning opportunities are severly limited; they can offer only local exchange and exchange access services.

When AT&T Assistant Vice-President W.P. Stritzler accepted the offer to address the gathering he said he felt like a missionary going off "to convert the pagans." But "now that I'm here, the missionary suddenly finds himself immersed in boiling water, with his name on the menu." It was an apt characterization of how AT&T was treated by the other speakers.

Stritzler tried to counter the criticism by pointing out that AT&T and its competitors have a common interest in serving the telecommunications user and preventing foreign companies from increasing their share of the U.S. market. But he reiterated AT&T's basic contention that it must be free to compete "under the same rules as other telecommunications and high-technology companies," a point that most of the phone company's competitors dispute.

During a question and answer session following Stritzler's speech, he was asked to comment on Bolter's charge that the settlement could raise rates substantially. Stritzler answered that a recent study by the National Telecommunications and Information Administration (NTIA) concluded the settlement would not cause local rates to rise significantly. But he conceded that this conclusion is based on assumptions regarding how much the Bell operating companies receive for the assets they sell to AT&T.

'Potential Weaknesses'

Attorney Philip Verveer, first chief of the Justice Department team that prosecuted the AT&T case and later head of the FCC's common-carrier bureau, told seminar attendees that the settlement suffers from a number of "potential weaknesses."

By failing to separate ATT's terminal manufacturing and marketing activities, the settlement fails to accomplish the government's major goal, according to Verveer; that goal was to end AT&T's vertical monopoly of the telecommunications industry — that is its ability to dictate prices and other terms for both transmission and equipment.

Western Electric has a significant advantage over the general trade in selling to the rest of AT&T, Verveer pointed out. The failure to remove that advantage is "probably the most vulnerable point" in the settlement.

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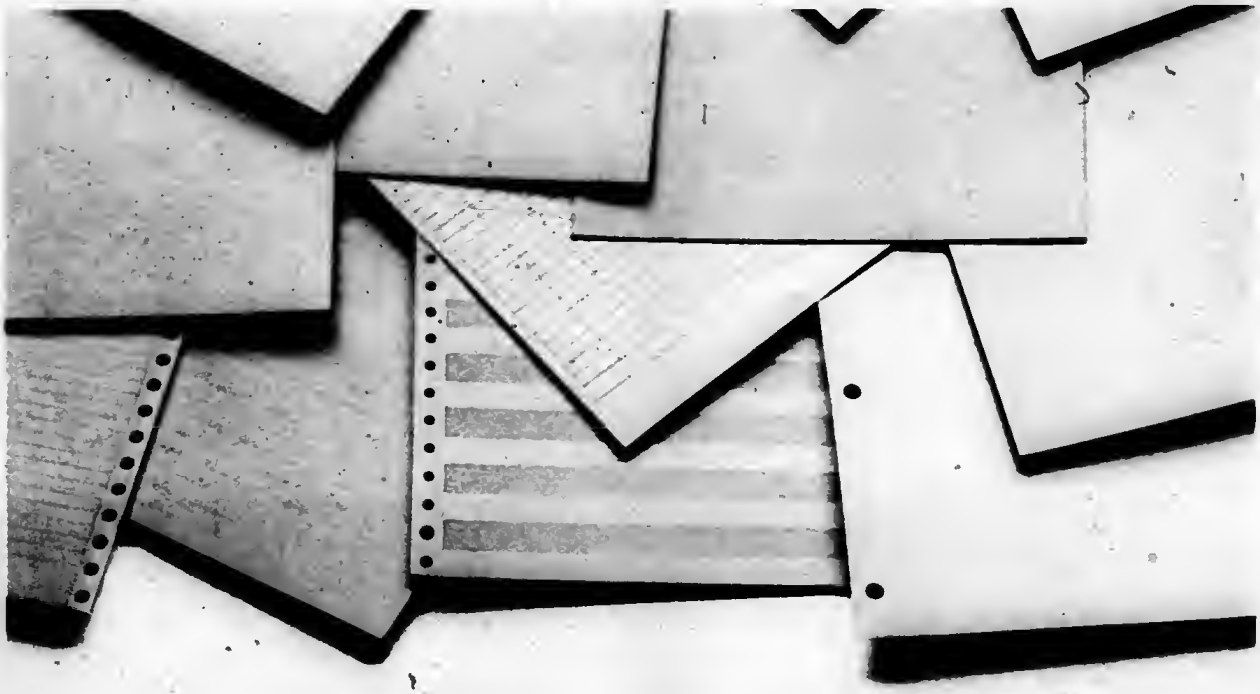

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June 12, New York — **Nuclear Disarmament Rally: Computer Professionals United for Nuclear Disarmament.** Contact: Computer Professionals United, c/o Dina When, 259 W. 10th St., No. 1E, New York, N.Y. 10014.

June 17, Washington, D.C. — **Computing and Government: Interactions and Achievements.** Contact: United States Department of Commerce News, Washington, D.C. 20234.

June 17-18, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

June 17-18, Paris — **The 1982 International User Conference.** Contact: McCormack & Dodge, 560 Hillside Ave., Needham Heights, Mass. 02194.

June 17-18, Chicago — **IBM's Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 17-18, Washington, D.C. — **Data Administration: Development and Practice.** Contact: Arnold Barnett, Barnett Data Systems, 19 Orchard Way, North Rockville, Md. 20854.

June 17-18, Boston — **Ada.** Contact: The Data Processing Management Association, Department Ada C, P.O. Box 91295, W. Century Blvd., Los Angeles, Calif. 90009.

June 19, Los Angeles — **Distributed Computer Network Architecture and Design Workshop.** Contact: Expertise Extension Workshops, 220 N. Glenoaks Blvd., Burbank, Calif. 91502

June 19, Anaheim, Calif. — **CICS/VS Advanced Control, Recovery and Debugging Workshop.** Contact: Expertise Extension Workshops, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

June 20-22, Andover, Mass. — **Electronic Mail: Implementation Case Studies.** Contact: Institute for Graphic Communications, 375 Commonwealth Ave., Boston, Mass. 02115.

June 20-23, St. Louis — **The 10th Annual International Conference.** Contact: EDP Auditors Association, Inc., P.O. Box 896, St. Louis, Mo. 63188.

June 20-23, Copenhagen, Denmark — **World Computing Services Congress III.** Contact: The Association of Data Processing Service Organizations, 1300 N. 17th St., Arlington, Va. 22209.

June 21, Stratford, Conn. — **Microcon-82.** Contact: Data Processing Management Association, P.O. Box 8447, New Haven, Conn. 06530.

June 21-22, New York — **Software Quality Assurance and Configuration Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 21-22, Chicago — **Quality Assessment of Analysis and Design Documents.** Contact: Anthony Formica, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

June 21-22, Boston — **Software: A Legal Briefing for DP Professionals.** Contact: The American Institute for Professional Education, Carnegie Blvd., 100 Kings Road, Madison, N.J. 07940.

June 21-22, Chicago — **Business Graphics for Financial Analysis and Decision Making.** Contact: Eloise Wenker, National Computer Graphics Association, 2033 M St. N.W., Washington, D.C. 20036.

June 21-22, Chicago — **How to Manage Data and Information as a Resource.** Contact: Arnold Barnett, Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

June 21-23, Boston — **Data Processing for the Non-Data-Processing Executive.** Contact: American Management Associates, 135 W. 50th St., New York, N.Y. 10020.

June 21-23, Englewood Cliffs, N.J. — **MVS Systems Management Workshop.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

June 21-23, New York — **Data Communications: Effective Network Design.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 21-23, New York — **Design of On-Line System.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

June 21-23, San Francisco — **Teleprocessing Software: An Introduction to Concepts, Systems and Application.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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June 21-23, Chicago — **Microcomputer Systems: A Guide to Selection and Application.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 21-23, Boston — **Program Dump Reading & Debugging.** Contact: Computer Education Services, 739 Boylston St., Boston, Mass. 02116.

June 21-23, St. Louis — **Programming in Basic: The Personal Computer Language for Today's Business Professionals.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

June 21-23, St. Louis — **The 10th Annual Data Processing Management Association (DPMA) International Conference.** Contact: DPMA Administrative Offices, 373 S. Schmale Road, Carol Stream, Ill. 60187.

June 21-23, Cambridge, Mass. — **Data Communications: Regulation, Analysis, Design.** Contact: The Datamation Institute, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

June 21-23, New York — **IMS DL/1.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

June 21-23, Chicago — **Automated Space Management Third Annual Users' Group.** Contact: Mr. Robert Bennewitz, Product Manager, The Cambridge Systems Group, 24275 Elise, Los Altos Hills, Calif. 94022.

June 21-24, Kansas City — **Project Management.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20914.

June 21-24, New York — **CICS/VS Testing & Debugging.** Contact: Comped, Ilene Zelin, 1133 Ave. of the Americas, New York, N.Y. 10036.

June 21-24, Cambridge, Mass. — **Four Specialized Languages for Education — Dynamo, Fourth, APL, Lisp.** Contact: Technical Education Research Centers, 8 Eliot, Cambridge, Mass. 02138.

June 21-25, Provo, Utah — **Graphics Utah Style '82.** Contact: Brigham Young University Conference Center, Provo, Utah 84602.

June 21-25, Jackson Hole, Wyo. — **How to Establish a Successful DP-Users Coordination Function.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

June 21-25, Washington, D.C. — **The Software Summit Series.** Contact: The Education Foundation of the Data Processing Management Association and The Washington, D.C. Chapter, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

June 21-25, Ann Arbor, Mich. — **The Programmed Learning Workshop.** Contact: Maggie St. Clair, Program Assistant, The University of Michigan, Division of Management Education, Graduate School of Business Administration, 1735 Washtenaw Ave., Ann Arbor, Mich. 48109.

June 21-25, San Francisco — **IBM Application Development Facility Workshop.** Contact: Data Knowledge, Inc., P.O. Box 1482, San Bruno, Calif. 94066.

June 21-25, Montreal — **MVS-SP Internal Logic, System Design and Performance.** Contact: Computer Systems Research, Inc., 195 W. Main St., P.O. Box 45, Avon, Conn. 06001.

June 21-25, Arlington, Va. — **Data Analysis/Data Base Design.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

June 21-July 2, New York — **Assembler Language Coding with Data Management and Supervisor Services Macros.** Contact: Spectrum Concepts, Inc., Suite 814, 150 Broadway, New York, N.Y. 10038.

June 22-23, Boston — **Vsam for Cobol Programmers.** Contact: Steven Comstock, 256 A S. Monaco Pkwy., Denver, Colo. 80224.

June 22-23, Arlington, Va. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

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June 22-24, New York — **Data Communications Concepts Seminar.** Contact: Memorex Customer Education, San Thomas at Central Expwy., Santa Clara, Calif. 95052.

June 22-24, Seattle — **Advanced Disaster Recovery Planning.** Contact: Devlin Associates, Inc., Suite 795, 1150 First Ave., King of Prussia, Pa. 19406.

June 22-25, McAfee, N.J. — **The Association of Data Communications Users Annual National Conference.** Contact: Association of Data Communications Users, P.O. Box 1184, New York, N.Y. 10101.

June 22-25, Chicago — **Human Relations: Productive Working Relationships.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

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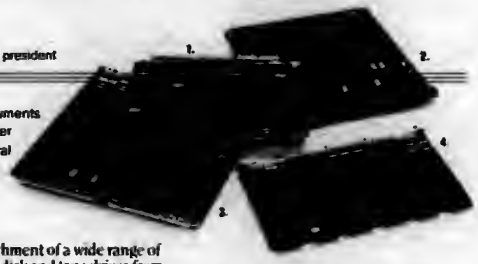

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OA Alone Won't Hike Productivity: Exec

By Jim Bartimo
CW Staff

MIAMI — "For the first time, we have the technological capabilities to change the office," Robert Erickson, manager of office systems at Digital Equipment Corp., said.

"But these changes have brought only marginal gains in productivity. We need to combine the application of technology and the application of an effective work process," he said at a session on "Strategies for Office Systems" during International Data Corp.'s 1982 Spring Executive Conference here.

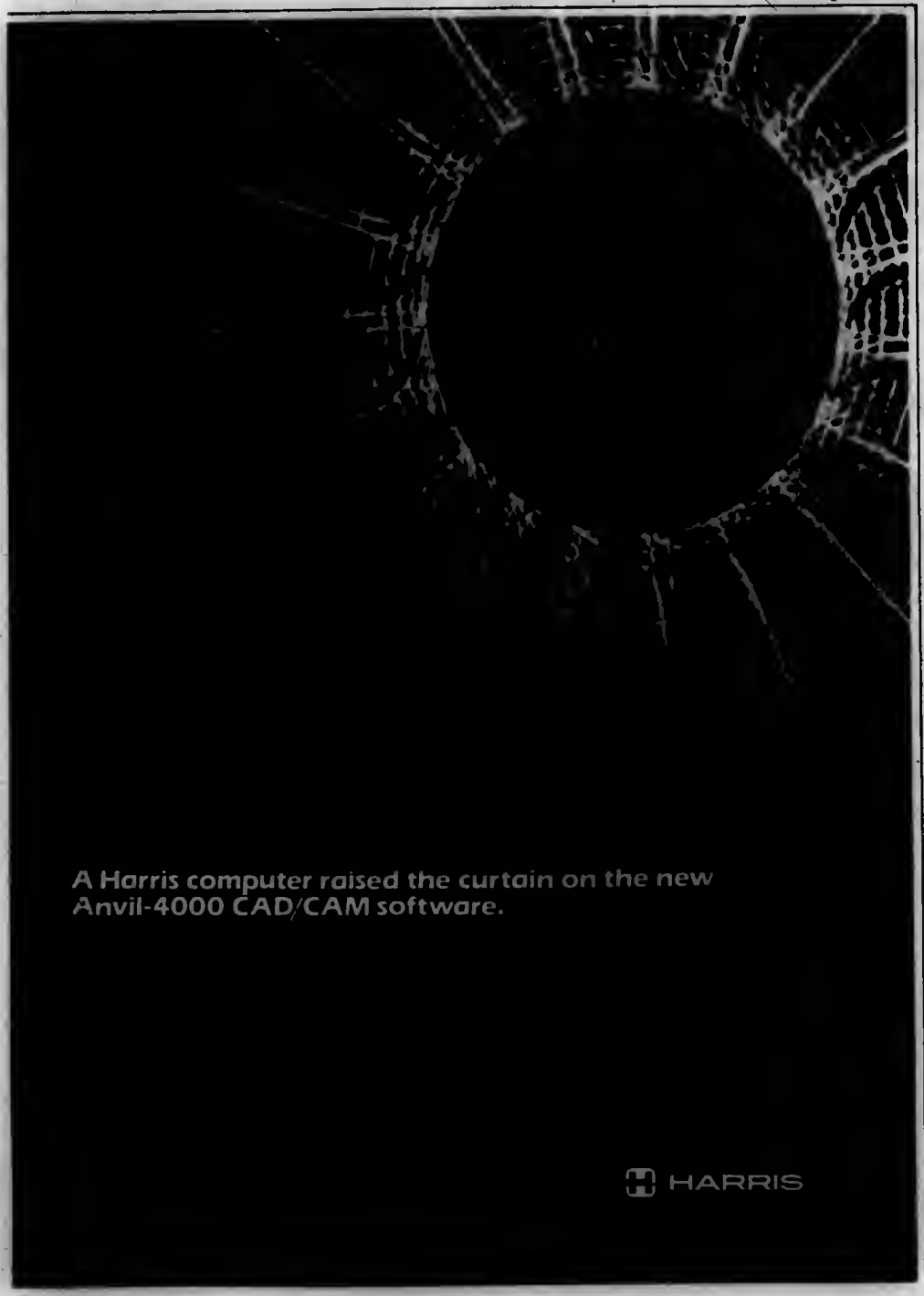
Erickson was able to provide attendees with an insider's view of office automation in a company with technology at its fingertips. More than 50% of the managers and professionals at DEC use more than 20,000 terminals and more than 50% of the secretaries use word processing on 4,000 terminals, he said.

But job satisfaction and effective management techniques proved to be at least equally important to office automation, according to Erickson. Using techniques attributed to the English business academician Enid Mumford, he identified three vital steps to creating an effective work process.

The company must form both a design group to identify business needs and a steering group to identify business goals, he said. These groups must forecast the company's future needs and suggest three ways to meet these needs.

The second step toward an effective work process is stabilization, Erickson explained. One of the suggested solutions to the company's business needs must be implemented, evaluated and supported by management. He describes this as an evolutionary process that must be recognized as such.

Finally, the company must be rebuilt to a certain extent, he continued. There must be a method of identifying the success of each solution and a method for changing solutions that are not working.



Speaker Cites OA Trends For Future

By Jim Bartimo
CW Staff

MIAMI — Based on a rapidly changing technology base, electronic mail will be the focus of four major office automation trends in the coming decade, according to Dr. John McQuillan, president of BBN Information Management Corp.

McQuillan cited the following four trends at International Data Corp.'s 1982 Spring Conference on "Strategies for Office Systems":

- Evolution of systems architecture — The decreasing cost of hardware and memory will play a major role in the emergence of new architectures, which include personal computing and local-area networking, McQuillan said. "The emergence of personal computing has just begun," he stated.
- Total electronic connectivity — A worldwide computer-based mail system (CBMS) is inevitable in the coming years, according to McQuillan. With increased internal networking, companies will have a greater ability to access information from around the world.
- Evolution of human interface — As users recognize that computer systems should be easier to use, a need for graphics, artificial intelligence and multimedia communications will arise, according to McQuillan. For instance, "graphics teleconferencing combines computer communications and voice communications," he said.

However, McQuillan warned that "spoken text input is at least 10 years away. We need to get used to typing for a while longer."

- True office automation — There will be many innovative electronic mail uses, McQuillan said, including fully integrated CBMS, word processing and file management. "Combined systems will be used to create, transmit and store intraoffice and interoffice letters, memos and all forms of type."

Impressive Net Capabilities

Datapoint 8600 Stands Out in Multiuser Test

By Hillel Segal
Special to CW‡

The Datapoint Corp. 8600 turned in mid-range benchmark times in multiuser testing, but the system's most impressive features involve its network capabilities.

In this column we return to coverage of the Association of Computer Users' Series 3 Benchmark Reports, which test multiuser systems costing between $25,000 and $50,000. Many of these size systems were discussed in *Computerworld* columns last year. All the systems were tested by our independent consultants at the University of Colorado, using standardized benchmark applications for various aspects of system performance.

The times discussed here include two tests from the larger group covered in the full reports. Some of the tests from the reports are comparable to the tests of single-user systems covered in recent CW columns. Others, such as the order entry test shown here, are unique to the multiuser report series.

In order to develop a capability for testing multiuser systems, Association of Computer Users' consultants came up with an eight-terminal simulator that acts as if it were eight operators typing data into terminals of the system under test. Next, order entry benchmark tests were written to simulate an actual application using from two to eight terminals.

The order entry program was then run with no other tasks in the system and two, four, six or eight terminals in use. Then a CPU-intensive program was run while the order entry test was going, again with from two to eight terminals. Thus, it was possible to gauge response time variations both with and without the added processor load. These times are listed in the benchmark reports.

The times shown here are from a simultaneous test. The times were taken when the order entry program was run on eight terminals while a single CPU-intensive task ran on an additional terminal. In one column is the CPU-intensive program time. The other column represents the response time for a 12-line transaction in the order entry test, when eight terminals were using the program simultaneously.

To estimate how long the system would take in responding to a lone-line operator entry for this program, divide the listed order entry figure by 12.

Distributed Processing

The results of various test times on the 8600 were a little unusual because of the distributed architecture of the system. In most of the systems we've looked at in this price range, a single processor is shared with a number of terminals. The Datapoint configuration included two processors sharing a single mass storage system with supplementary terminals attached to the primary processor.

Because of this configuration, the two tasks in the simultaneous test — the CPU-intensive and the order entry — ran on different processors. As a result, the times for the simultaneous run of both tests were the same as those yielded when the tests were run separately.

While that may seem a little unfair to other systems in this series of tests, it reflects the reality and purpose of distributed processing: sharing the load by attaching as many processing units as necessary.

The order entry test time of 5.2 sec for response to a 12-line record input placed the 8600 about midway in the field of a dozen systems. Response degraded little between two and eight terminal tests, and the exact same times were recorded when the CPU-intensive test was run at the same time.

The complete configuration tested included a Model 8630 system with integrated terminal and detachable keyboard, a total of 256K bytes of memory, a 20Mbyte disk drive and a cartridge tape drive of the same capacity. In a single-user configuration this package, including a 160-Hz printer and system software, would cost $38,675.

The second processor was a Model 8601 with 128K bytes of memory and its own terminal. Together with a multiport communications adapter, it brings the two-terminal price to $48,175. The addition of six Model 8200 workstations raises the eight-terminal cost to $59,545.

Both processors are 16-bit types with support for a local printer and a communications interface to the Attached Resource Computer (ARC) network. The network interface is built into the 8600 series processors instead of residing in a separate box as in the 6600 series Datapoint processors.

The ARC network was first released in 1977, then enhanced in 1980 with the introduction of the Resource Management System (RMS) operating system. Using RMS, each user has access to all the resources on the network, including both hardware and software. Whether the user is working at a nonintelligent terminal or at a processor, all the commands and functions are the same. The processors have multitasking capability, allowing them to manage disk resources at the same time they are handling applications chores.

Users spoke highly of the network, saying it allowed modular system growth and flexible resource sharing. They also commented favorably on the amber display screen at the terminals, saying it eased eyestrain. Their most frequent complaint, in our informal telephone survey, was with the 45Hz daisywheel printers that many had purchased. "They don't print with consistent quality and are awkward to use mechanically," one user said.

The software supplied includes various utilities and communications support for IBM and Datapoint protocols as well as RS-232. Languages available are Cobol, Fortran and RPG, plus Databus, Datashare and Chain languages, which are unique to the firm. The benchmark team used the Databus language, commenting that it was easy to learn and compile into intermediate code very quickly. But they felt it was a little too simple, lacking structured programming statements.

Datapoint doesn't supply application software except for the word processing package, called Integrated Electronic Office Station. Users were generally happy with that software product, saying it was easy to learn, user-oriented and worked well in conjunction with the network capabilities.

While user comments about the firm's documentation varied (as is often the case, since there are many different kinds of users), there was nearly unanimous praise of the company's hardware service.

Various Users

The users we surveyed included several banks, wholesale distributors, an engineering and construction firm and large departments within corporations. Most were employing the ARC network, and many had owned various Datapoint products for years. For some, however, the 8600 system was their first in-house computer.

About three-fourths of the users had the word processing package. Other applications included accounting, scheduling, electronic mail and color graphics. When asked why they had chosen a Datapoint product, most cited the advantages of modularity and versatility; many also mentioned their prior experience with the firm's products. The multitasking and networking capabilities were many users' favorites. Those who had the RMS operating system were very positive about it, while others with the simpler DOS operating system were also happy, though less enthusiastic.

Datapoint said the ARC network is now a third-generation networking product, and the firm has announced a new product that it said will be a fourth generation. The system uses a coaxial-cable interconnect and has proven its reliability. The advanced capabilities ARC offers have apparently won many fans among users, making the 8600 an impressive offering for business users desiring a distributed processing environment and a modular expansion path.

Segal is president of the Association of Computer Users, a nonprofit association with members in the U.S., Canada and several other foreign countries. A package of information about the Association of Computer Users is available from the group at P.O. Box 9003, Boulder, Colo. 80301.

SCOREBOX

System: Datapoint 8600
Price with one terminal: $38,675
Price with eight terminals: $59,545

SYSTEMS UP TO $50,000

System	Eight-Terminal Simultaneous Test (E-4) CPU-Intensive Task Time	Order Entry Response Time
Wang 2200MVP	16.4	4.6
IBM Series/1	(1)	(1)
Texas Instruments DS990/4	135.2	4.3
Hewlett-Packard 250	(2)	(2)
DEC Datasystem 355	84.1	16.1
Alpha Micro AM-100T	45.2	5.7
Microdata 4000	239.7	3.4
Data General CS/50	112.4	9.8
Altos ACS8000-10	(3)	(3)
Burroughs B91	(4)	(4)
Ultimate A1	(5)	(5)
Datapoint 8600	57.4	5.2

Notes:
1. Simultaneous test was not performed due to testing difficulties.
2. Eight-terminal test not possible. Four-terminal test: CPU — 47.6, Order Entry — 2.3.
3. Eight-terminal test not possible. Two-terminal test: CPU — 473.1, Order Entry — 6.8.
4. Tested using Burroughs remote terminal emulator: CPU — 10.2, Order Entry — 3.2.
5. Eight-terminal test not possible. Six-terminal times: CPU — 135.2, Order Entry — 1.9.

This is the 54th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports are available from the Association of Computer Users.

EDITORIAL

A Fine Line

The line between computer-related creativity and computer abuse is sometimes a fine one, involving educational administrators in an unenviable balancing act. When academic officials are confronted by situations like the recent one at Texas A&M University — where a student stands accused of altering grades stored in a college computer file [CW, May 24] — who can blame them for formally drafting and implementing regulations against computer abuse? Any type of casual honor system becomes unrealistic.

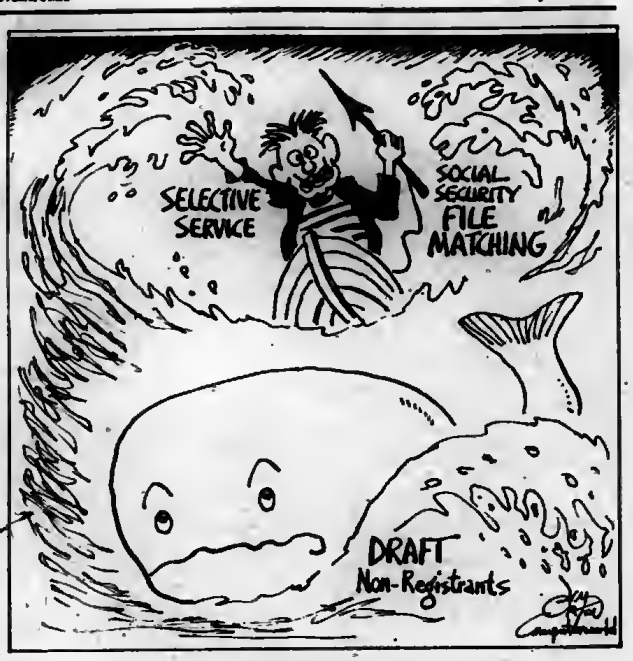
A&M officials apparently decided to regard the student's alleged action as a crime rather than a prank. As a result, the student is facing both criminal charges and disciplinary action.

Other schools may be hoping to avoid the same type of situation by beefing up computer security before any abuse takes place. This is reasonable for universities with a rapidly growing population of computer science students and a corresponding increase in computers and remote terminals. The sheer numbers of students and equipment make it difficult to keep track of systems users, locations and actions, necessitating a formal, written set of rules.

Regulations that prohibit the use of a college computer for commercial purposes or for access to confidential information are indubitably in order. After all, the same system tinkering regarded as an infraction in college leads to job termination in the business world.

However, academic officials must remember that a major purpose of higher education is to stimulate creative thought rather than stifle curiosity. They must use the regulations they draw up as guidelines rather than as a set of hard and fast rules. Any case of reported computer abuse on campus should be judged individually and with a flexible attitude by responsible officials who are familiar with how a computer system works.

This practice will inevitably take more time than simply pointing to the rule book and instituting disciplinary action. But the alternative could mean computer science graduates who are incapable of original concepts — and that alternative is unacceptable for both the students and the companies that need those new thoughts.



DATA PAST

Five Years Ago
June 13, 1977

Having met with limited success in Congress for its Consumer Communications Reform Act, Bell Laboratories geared up for similar efforts in the state legislatures.

Although limited in scope, anticompetitive bills were introduced in two states, Massachusetts and Minnesota. Resolutions supporting basic provisions of the reform act were introduced in five other states.

— — —

WASHINGTON, D.C. — Several trade associations and manufacturers of communications and DP equipment filed comments with the Federal Communications Commission stating that the communications common carriers should be deregulated to the point where they could provide data processing services. Many organizations, however, said they opposed cross-subsidization.

Ten Years Ago
June 21, 1972

MAYNARD, Mass. — Digital Equipment Corp. announced a programmable communications front-end processor for use with IBM 360/370 systems. The DEC 11D23 was said to be the first front end to require no polling by the central system, relying instead on interrupt techniques used with conventional peripherals.

— — —

CLEVELAND — The median salary of analysts, senior analysts and managers reached $16,739 in 1971, according to figures released by the Association for Systems Management (ASM).

The figure amounted to an annual increase of 4.2% since the last salary study in 1969, when the median salary was $15,435. From 1965 to 1969 the annual increase was 7.3% from an $11,969 base, ASM reported.

LETTERS

Clear Definition Needed

The outrage over the Weg decision ["DPers on Weg Ruling: Personal Use of CPU Same as DP Abuse," CW, May 10] is quite understandable in terms of its broader implications. But the legal issue turned on a distinction that lawyers appreciate and laymen do not. That is, the difference between the common isw definition of larceny vs. embezzlement.

There was a story told about a bank teller charged with embezzlement. His attorney argued to the jury that his client may well have been guilty of larceny but certainly not embezzlement. The issue, he said, was one of time and intention. If the teller intended to steal the money when it came into his possession rather than after he put the money into his till, it was larceny. If his intention was formed subsequent to the actual receipt of the customer's funds, the crime was embezzlement. Actually, he said, his client intended to steal the money from the very start so he could not be guilty of embezzlement.

His argument won the jury over and his client was acquitted. Enraged at the decision, the district attorney had the teller indicted for larceny. At the subsequent trial, the teller's attorney argued with equal eloquence that his client was guilty of embezzlement, not larceny, and again had his client acquitted by the jury.

The real problem with the Weg decision is that without a clear definition of what constitutes *unauthorized* computer use or what constitutes computer *abuse* we are likely to see more Weg decisions.

I don't agree that current criminal statutes are enough. We have already had a substantial number of computer crime cases lost because the members of the judiciary and some prosecutors neither appreciate the nuances we use in DP nor the implications and consequences of the abuse of computer technology.

Jack Bologna
Computer Protection Systems, Inc.
Plymouth, Mich.

'Sour Grapes' Attitude

I detected a "sour grapes" attitude in *Computerworld's* interview with Karen Nussbaum ["9 to 5 President Raps Office Automation," CW, May 3]. I think if people would stop worrying about how many jobs are going to be eliminated by office automation and instead look at how much more work can be accomplished through office automation everything would be in a much better perspective.

Office automation has been brought on by overemployment (too much work for one, not enough for two) and declining productivity (two working at 60% to 75% capacity instead of one at 100% capacity) with some assistance through automation.

Children are not even being taught to give 100% any more. All over this country people are sitting in offices bored to death because they do not have enough work to keep them busy.

In these times of belt-tightening, efficiency and speed are the keys. A person trained in word processing is more highly skilled than someone who types on a manual typewriter. In my opinion, office automation increases skills and increases the value of office jobs by allowing the office worker to learn a new technology.

Whether Karen Nussbaum likes it or not, office automation is here to stay. The best thing people who are confronted with it can do is to start figuring out how it is going to make them more valuable and efficient to their company.

Sheri Sweet
Programmer/Analyst
Central State University
Edmond, Okla.

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READER COMMENTARY /Miles W. Meadows

Comparing Case Histories in MIS Management

Over the years it has been my experience in the management information systems (MIS) arena that the truly productive organizations have several things in common.

The head of the MIS function is a member of the management team and is privy to and participates in the top-level decision-making process. The head and his immediate subordinates have identified with company objectives, strategies and policies and are in a position to discuss problems and objectives with the top echelon of the company.

The MIS organizational objective and plans support the overall goals of the enterprise. The level of effort is concentrated on those aspects that contribute to the welfare of the company and not on methodology and technology.

The top echelon of management considers the MIS function to be a major corporate resource to be utilized for the benefit of the organization. Since it is a major resource, the function receives the management attention its potential deserves and is scrutinized in the same manner as any other corporate resource.

Corporate politics have been muted because the head of MIS has, on a regular basis, promoted the value of his function to managers and operational users. These personnel have always been encouraged to contribute to the definition of MIS requirements. This sensitivity to the needs of the user organizations gives them a sense of comradeship in the undertakings of MIS.

Joint Venture

Since this is considered a joint venture and most everyone has had a hand in it, the eternal bickering, back-biting and undercurrents so prevalent in most MIS organizations is held to a tolerable level. The head of MIS is always careful not to play one-upmanship.

The human resources aspect is given the attention it deserves. There are clearly defined career paths for both managerial and technical personnel. Up to a certain point these command parallel compensation. The opportunities to exhibit individual initiative, imagination and personal development are apparent. The right to express an opinion or to dissent is encouraged.

Communication is open and aboveboard. Employees are kept abreast of current happenings and future plans. Above all, the staff is kept in a challenging environment as opposed to a crisis situation. They are told not only what, but also why something is to be done and its relevance.

Schedules and milestones are tight but reasonable. In the pursuit of a deadline the staff has access to management and users without going through a formal "pecking order." Productivity, as opposed to long hours, is rewarded. Mistakes and foul-ups are freely discussed as a learning process.

What this sums up is that the MIS function is well managed and the managerial aspects far outweigh the methodological and technological considerations.

Change, evolutionary and sometimes revolutionary, is a way of life in any enterprise. These changes can come in any form and for any reason, such as a change in product lines, marketing strategy, acquisition, investment policy or a change in general thrust and direction.

Whatever the change, and for whatever the reason, the system's structure is flexible enough to accommodate these changes without major disruption.

Top management's confidence in the MIS function, through its understanding of the enterprise and its management processes, greatly facilitates the ability to accommodate change.

Total Solution?

Too much has been said and written on the utilization of methodology and technology as a means of gaining productivity from the MIS function. These have been touted as the "total solution." They come in various forms and with varying degrees of tout.

However, my experience has been that all the methodologies and techniques, such as structured analysis, structured design, programmer aids, data base management systems and so on, will be of limited help without the aforementioned common things.

To illustrate a point, I would like to offer two case histories. In the company of several others I recently visited two companies of comparable size in terms of gross revenue, invested capital and number of employees.

Although each served a different market, neither was the dominant company in its industry. However, Company No. 1 did enjoy certain advantages.

Company No. 1. — Upon our arrival, and after "cooling our heels" for a time, the vice-president for MIS ushered us into the data center. There he showed us the hardware, terminals and remote teleprocessing setup and explained the software in use.

The vice-president was quite proud of the fact that he had the latest large-scale, state-of-the-art computer system, the latest software release, an extensive network of remote stations and more than 100 employees in the MIS function. The MIS costs as a percent of gross revenues ran about 2.3%.

Back in the office, the vice-president showed us the MIS organizational chart and briefed us on most aspects of the function. He explained that he was hard-pressed to recruit and retain qualified personnel. Turnover ran about 25% and this created a serious morale problem.

Morale was further affected by top management's lack of understanding and backing, the unreasonable deadlines, the inability to extract a clear

(Continued on Page 26)

HUMAN CONNECTION /Jack Stone

How to Overcome Intimidation: Shaping Up a Data Center Staff

This is Part 5 of a continuing series on how to succeed as a data center manager.

"A multidimensional bout among wild-eyed humanoids who are unceasingly thrashing around chasing their own tails" is how I would describe the operations of the typical data center today.

Stephen Roberts, a manager of the data center at the Catholic University of America had been a willing participant at several such places prior to taking his current job five years ago.

At that time, he chose to accept the challenge of changing the course of his center's destiny and prove, at least to himself, that the development and operations of large-scale computer systems can be properly managed.

Here is his assessment of what he faced:

"Our staff of nine analysts and programmers was trying to work on nearly 250 active tasks. Even worse was the matter of task priorities. You see, each analyst was assigned one or more systems and, as such, dealt directly with the users.

"This form of organization has the theoretical advantage of decentralized technical decision making and priority setting. But it turned out to be a disastrous failure in practice because our DPers, being an accommodating lot like most in the business, really didn't set priorities at all; instead, they committed all development and operating tasks to the 'as soon as possible' category.

"Our people certainly meant well for the users but they wound up antagonizing them. Most of the users were upset, to put it mildly, not only because they weren't seeing the center fulfill its commitments, but because the knowledgeable DPers weren't around to give them status reports and answer questions.

"During prime shift, the staff was usually sleeping it off at home, having been up most of the night attacking production problems.

"Our managers frequently offered to negotiate with the users and pare down the task backlog, encouraging the analysts and programmers to stop working so hard and so long and come to the center during regular hours.

"Paradoxically, the staff was quite offended and deeply resented such offers. The typical comment was: 'You managers don't understand the problems of my users. They have important demands placed on them and I must give my all to get them results.

" 'This requires a substantial effort on my part and a great deal of thought and energy. I can't be a quality programmer and be expected to be creative on demand. You would stifle my productivity if you were to force me to work nine to five, and if you try it, I'll leave for another job!'

"This attitude, which I believe is prevalent in the industry, leads to several critical and intolerable personnel situations that I also think are widespread.

"First, the DPers really suffer under the strain of work pressure, usually burning themselves out after a few years and leaving for a new employer.

"The typical reason given at the exit interview is that the center is out of control and the work load requires extensive overtime.

"The truth is that it's not the center but the staff that is out of control. Of course, they repeat the cycle again and again, not wanting — or knowing — any other kind of life.

"The second situation concerns the relationship between center management and technical staff. A great many managers are now — and have been for years — intimidated by the analysts and programmers who work in their own wild ways to achieve a sense of exhilaration from their accomplishments.

"These managers fear, with much justification, that if they were to attempt to establish reasonable work rules, the staff, which possesses the detailed knowledge of all the major systems, would leave. The same managers refuse to accept the fact that the staff will burn out and leave anyway, so they might as well try to get control of the situation.

"Shortly after I became the manager of systems and programming, I decided that no staff member would threaten me on any basis and that I had to establish control. But I couldn't dictate a nine to five workday immediately because the entire department would have waltzed out the door.

"Had this happened, I would have been in deep trouble and probably out of a job.

"Instead, I told the staff to identify their two most critical tasks and carry them through to completion. I declared that the other 230 tasks in the work queues were deferred and I assumed full responsibility to explain away the delays to the users.

"With this strategy, there was no legitimate reason why the staff couldn't be expected to show up during normal business hours. But, oh did the fur fly!"

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

Tuning in to Successful MIS Management

(Continued from Page 25)
definition of requirements and an involvement by users.

Systems and program maintenance were consuming 60% to 70% of available resources and changes were getting out of control. Program fixes were commonplace and long hours a way of life. The vice-president stated that he and his people generally put in 10 to 12 hours per day plus some weekends and holidays. However, as he put it, they "got the job done."

The short- and long-range plans consisted, for the most part, of a schedule for acquiring hardware and software. There were plans for a data collection system, but this, too, involved hardware and, to a lesser extent, software.

The computer was utilized occasionally by the engineering and the quality assurance departments, but was never used by the research and development organization. The environmental control department had requested a modeling system to balance production and help the flow of control. However, they were having trouble defining just what was required.

The vice-president stated that he lectured frequently, was on the advisory committee at the local university, had published several articles and papers and took an active part in fee-based seminars sponsored by national organizations.

Upon departure, the vice-president invited us to attend a seminar on software for the '80s being sponsored by a national organization.

Company No. 2 — Upon our arrival, the director of MIS ushered us into a conference room, served coffee and engaged us in a few minutes of idle chitchat.

After briefing us on the company, the director then turned to the system structure and explained how each supported some aspect of the business, how each was integrated and their interrelationship, the short- and long-range plans for future systems development and then showed us his hardware and software configuration.

The director showed us samples of reports and screens and explained how the systems were used in support of marketing, manufacturing, materials management and so on. He freely permitted us to ask questions of his employees and honored requests for displaying specific data.

The engineering, quality assurance, research and development and environmental protection departments utilized the computer frequently. The director allows open shop for these departments and gives assistance when requested.

The personnel we came in contact with were well trained, with above-average morale, and exhibited enthusiasm for the company. The director stated that the turnover rate was low. He said he did experience a lively turnover among his senior personnel as they were in demand by other organizations within the company. His thoughts on this matter were mixed...

Total employment in the MIS function was 50. Cost, as a percent of gross revenue, was .6%.

'Normal' Working Hours

The director stated that occasionally he or some of his people worked past normal hours. However, this was the exception rather than the rule and was usually the result of something gone wrong — not to meet a deadline, although this sometimes happened.

His department spends about 20% to 25% of its resources on systems and program maintenance. As he has the confidence of top management and is considered part of the team, changes are planned far enough in advance to permit orderly implementation.

The director explained that he belonged to a couple of national organizations and regularly attended meetings. He said he was a somewhat passive member and attended primarily to "jaw" with others in his field. He did state that on occasion he found the meetings and presentations very informative and helpful.

He has never published an article or paper and has never been asked to participate in a formal seminar. He did, however, teach a course in systems design at the local college.

Upon our departure, the director introduced us to the company president, who exhibited an above-average knowledge of what was being done by MIS and was well versed in its future plans.

It is interesting that each visit lasted about four hours. We never really did find out, except by name, what Company No. 1 actually did. The director of Company No. 2 was never interrupted during our entire stay, while the vice-president of Company No. 1 spent a lot of his time on the telephone or conferring with his people.

In the MIS community, the vice-president of Company No. 1 enjoys the reputation of being on the leading edge of the state of the art and is in demand for lectures and consultation. The director of Company No. 2 is reputed to have only a small or medium-size computer system and a small staff. He has never been asked to lecture or act as a consultant.

Meadows is manager of MIS at Sverdrup Technology, Inc. in Tullahoma, Tenn.

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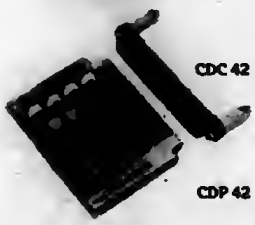
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CW 0531

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LETTERS

Compliments to CW

I was delighted to read "OA 'Best Thing' for Career Women: Jan Rose Presents the Defense Against 9 to 5" [CW, May 10].

I could not agree more with Jan Rose when she says that "office automation is, probably the best thing that has happened as far as career advancement possibilities for women."

Properly implemented, office automation provides more and better career opportunities for men and women at all levels. Office automation takes the tedium out of clerical tasks but leaves the thinking part intact.

My compliments to *Computerworld* for getting an excellent interview. I only wish it had been printed on Page 1.

Walter E. Ulrich
President
Walter E. Ulrich Consulting
Houston, Texas

College Controversy

In answer to Julian S. Williams' reader commentary "Defining the Functions of Computer Specialists" [CW, May 10], I have the following comments.

First of all, most of the general job classifications are, and have been, in existence for many years. Those of us who are active in the computer market know the job descriptions intended for these classifications.

Most importantly, I think Williams has completely missed the boat on the controversy concerning the education of computer professionals. The controversy is that the colleges and universities are not doing a bang-up job in educating people for the computer science real world.

I have found that about half of the so-called "computer freaks" who eat, live and sleep bits and bytes left college because the computer courses were too slow and boring. These are the type of people who program the interfaces, operating systems, drives and so on.

I'm not saying that they are better as a whole, but it should go to show that if you spend more time with the computer, you naturally become more proficient at programming.

My point is somewhat proved by the fact that IBM can teach a Cobol course in a couple of weeks while the university takes a full semester. Why can't they take less classroom time and use the rest for problem solving and programming? This would give students a lot more experience in the actual use of the skill.

I've had programmers who never used a two- or three-dimensional table — computer science majors! Handling multiple files (if more than three) seems to be something totally new.

As a former software manager, I found that degrees are nice on paper — but give me a programmer that I don't have to teach!

Ruby Kutzer
Mount Prospect, Ill.

University Failure?

John W. Hamblen, in his letter to the editor [CW, May 10], still fails to address a major reason why the universities fail to attract doctoral-level students. That is, the prevailing attitude that such studies must be pursued in residence, only on a full-time basis and most often do not recognize the learning that takes place with practical experience.

Thus a situation is presented that forces the mid-career professional to give up two or more years of career development and income growth. It may also require sitting in classes in which learning has already occurred.

This situation presents a loss of time and income which cannot be recovered. While some mid-career professionals can and do make this sacrifice to further their education, there are those who are unable to do this but would like to pursue doctoral studies. If it is the universities' desire to attract a greater number of doctoral students, then they need to change their attitudes and become more oriented to the mid-career professionals.

The creation of external (nonresidential) doctoral-level degree programs would alleviate this problem.

Russell L. Staley
Deer Park, Texas

'Surveillance' Now Fits IBM DL/1

IRVINE, Calif. — Users of the Surveillance CICS security system from Towers Systems, Inc. reportedly can now apply that system's security mechanism to IBM DL/1 data bases as well as to terminals, files, programs, transient data destinations and non-CICS resources, according to the vendor.

With Surveillance, access to individual data base segments and fields within segments can be restricted, because the user can specify the entire structure of the DL/1 security scheme, the vendor said. The system also provides resource management facilities, electronic mail and message-routing functions, as well.

The menu-driven software ranges in price from $18,000 to $24,000 for a perpetual license. Towers Systems is based at Suite 365, 19782 MacArthur Blvd., Irvine, Calif. 92715.

'Dataquery' Enhanced

PRINCETON, N.J. — Release 2.2 of Applied Data Research, Inc.'s (ADR) Dataquery relational query package has been announced. The latest version reportedly supports full Boolean selection of ADR's Datacom/DB data base records and runs IBM 4321, 4331, 370/115, 370/125 and 370/135 processors in OS and DOS environments.

Release 2.2 provides a VIEW command that allows users to list names and aliases of records, files and keys to which they have access. It also includes a command called HELP that enables users to obtain explanations at the terminal of Dataquery commands and session control parameters. Users can define and catalog terms

(Continued on Page 32)

CDC's, DEC's Time-Sharing Called Most Cost-Effective by RDC Study

By Lois Paul
CW Staff

STAMFORD, Conn. — Time-sharing services based on Control Data Corp. processors and Digital Equipment Corp.'s Decsystem-20 are the most cost-effective in relation to CPU charges, according to a study published by Real Decisions Corp. (RDC).

However, when it comes to storage and connect charges, services based on IBM systems running under CMS and TSO are the least expensive; the most expensive are CDC- and Decsystem-10-based systems, the study revealed.

These results appeared in RDC's 1982 edition of *Timesharing Decisions*, which compares 32 remote computing services (see box) on the basis of 23 benchmarks designed to test I/O data handling capabilities and computational power.

Six Major Hardware Groups

Benchmarks coded in Fortran, Basic and Cobol were run on each time-sharing services to determine CPU charges. In addition, 26 of the 32 services were divided into six major hardware groups — CDC; Decsystem-10; Decsystem-20; Honeywell, Inc.; IBM CMS; and IBM TSO — to compare relative average CPU costs of the benchmark runs.

Based on this composite hardware analysis, CDC and the Decsystem-20 group tied for first place, winning all but one of the 23 first place finishes, according to RDC. CDC-based services dominated the Cobol and Fortran I/O intensive runs and the Decsystem-20-based group scored the most first place finishes in the individual runs. The researchers noted that the latter was the case primarily due to cheaper average costs for CPU-intensive Basic and Fortran runs.

SERVICE	HARDWARE
ADP Network Services, Inc.	Decsystem-10
American Management Systems	Decsystem-20
Being Computer Services	
• Mainstream — CTS	IBM
• Mainstream — EKS	CDC
• Mainstream — TSO	IBM
Chase Econometrics/ Interactive Data Corp.	IBM
Cliishare	
• DEC Service	Decsystem-20
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Computer Sciences Corp.	Univac
Comshare, Inc.	Xerox Sigma 9
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Control Data/ Business Information Services	IBM
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• MARK 3000	IBM
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Lendart Systems, Inc.	Decsystem-20
McDonnell Douglas Automation Co.	
• DAC-II Service	CDC
• TSO Service	IBM
National CSS, Inc.	IBM
Rapidata	Decsystem-10
SUN Information Services	
• CMS Service	IBM
• TSO Service	IBM
Timesharing Consultants, Inc.	Decsystem-20
Tymshare, Inc.	
• Tymcom-X	Decsystem-10
• Tymcom-370	IBM
United Information Services	
• Apex	CDC
• AS-6/370	IBM
• DEC-10	Decsystem-10

1982 Edition of RDC's *Timesharing Decisions*

Honeywell-based systems reportedly finished in a strong third place for CPU costs, followed by CMS-, TSO- and Decsystem-10-based aystems, in that order.

The RDC study included an analysis of the changes that occurred since last year's study. The researchers found a major difference between the price changes announced by the time-sharing vendors and the actual increases revealed by a comparison of the benchmark costs from last year to this year.

Only two vendors announced

(Continued on Page 32)

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CW531

Security System Unveiled For Intercomm TP Monitor

NEW YORK — Software Design Associates, Inc. (SDA) has made available an Extended Security System (ESS) for its Intercomm teleprocessing (TP) monitor for use in IBM OS/VS environments.

The ESS provides access control for either the single- or multiregion terminal user under Intercomm, according to the vendor. Individual users must sign on with a unique account code and password enabling management to maintain strict internal control.

Different levels of authority can be created and administered on-line to ensure the integrity of the data processing environment, the vendor said. Access to Intercomm-controlled system resources such as application programs, transaction codes, terminals and files is validated without interrupting system performance.

The ESS is priced at $10,000, SDA said from its offices at 71 Fifth Ave., New York, N.Y., 10003.

Via Comshare T/S

'Audimate' Automates CPA Tasks

ANN ARBOR, Mich. — Comshare, Inc. has added a companion system to its time-sharing service for use in analytical reviews of interim and year-end financial statements by certified public accountants (CPA).

The lead schedule preparation capability, called Audimate, is said to automate tasks that require accountants to record account detail by hand and then to manually foot, crossfoot and validate each schedule.

Audimate can generate similarly formatted lead schedules with account totals, account category totals, footing and crossfooting for every account on a CPA client's general ledger, the vendor said. The work can be done at any stage of the audit with up-to-date schedules with auditor-approved headings on standard columnar work paper forms.

Lead schedule systems also post, total, check balancing and provide reports on adjusting and reclassifying journal entries, according to the vendor.

Both the analytical review and the lead schedule systems are transaction priced, based on the number of reports generated, the vendor said.

There is an initial $2 fee for each lead schedule and a $25 fee for each analytical review report run.

Comshare is headquartered at 3001 S. State St., Ann Arbor, Mich. 48106.

Study Compares T/S Services

(Continued from Page 31)

CPU increases of over 15% and, in both cases, the changes made to hardware and/or software yielded approximately the same benchmark costs as in 1981, according to RDC. Only three other vendors increased CPU units, all in the 5% to 15% range.

In addition, 13 vendors showed increased costs in the benchmark results this year, the researchers continued. Two of these had cost increases greater than 25%. Four other vendors remained almost the same as last year and four more showed decreases in the 5% to 15% range.

The RDC analysts cited the fact that only five vendors performed according to price sheet expectations illustrating the need for constant evaluation of the CPU cost area.

In terms of connect charges, over half of the control group raised some or all of these charges in the past year, the researchers noted. Only one reduction was noted, which was a discount for nonprime connect time. Only five of the 23 control group vendors indicated increases in storage charges.

In addition to the cost analysis, *Timesharing Decisions* includes an informational overview of each vendor in terms of facilities, support services and standards of performance. The study also includes extracts from the vendors' price schedules that were in effect in May 1982.

The cost of the RDC report is $795 plus postage and handling. Reports may be ordered by contacting RDC at 123 High Ridge Road, Stamford, Conn. 06905.

Dataquery Upgrade Out

(Continued from Page 31)

and phrases that are frequently referenced in query.

Release 2.2 includes a facility for saving qualified records for further processing. Saved records may be processed by Dataquery or ADR's Datareporter, an information retrieval and reporting system.

On-Line, Batch Processing

They also may be processed by on-line and batch user application programs, the vendor said.

Two new user exits are also provided in this release. One user exit allows examination of a query before it is processed and the second allows subprogram processing of previously defined mathematical functions at "set" execution time.

The permanent license price for Dataquery starts at $15,500 for OS, $13,000 for DOS and $9,800 for the IBM models listed above. ADR is located at Rt. 206 & Orchard Road CN-8, Princeton, N.J. 08540.

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Screen Tilt	✔	✔			✔
Read Cursor Address	✔		✔	✔	✔
Detachable Keyboard	✔	✔			✔
Separate Function Keys	9	3	1	1	11
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Insert/Delete Character Key(s)	✔		✔		✔
Clear EOL/EOP Key(s)	✔		✔		✔
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'Hibol' Bows for IBM, Series IV Users

EDEN PRAIRIE, Minn. — Delphi Data Systems, Inc. has unveiled Hibol, a Cobol program generator that includes an integrated data dictionary for users of IBM and plug-compatible equipment running under OS and DOS and on Four Phase Systems, Inc.'s Series IV computers.

A 60-line Hibol program typically results in a 1200 line Cobol program and the automatic generation of IBM CICS screen maps plus associated documentation.

Hibol is said to generate modular Cobol programs for both on-line and batch processing. On-line programs can include menus, file maintenance and file inquiries with a single program handling multiple screens and files. Screens reportedly can be flexibly linked.

Hibol batch programs were designed to process multiple files and produce multiple reports. Other batch program functions include selecting, sorting, merging, updating and subtotaling. An INSERT function reportedly enables Cobol program statements to be placed directly into the generated program.

Hibol Software

The Hibol software reportedly can generate images of screens/reports with descriptions of the accompanying data elements. This information can be merged with user-written material to produce manuals and other documentation.

Hibol includes documentation and training materials and is priced at $9,500 for the DOS version and $13,500 for the OS version, from the vendor at 9905 Hamilton Road, Eden Prairie, Minn. 55344.

'BIM-Odis' Updates CICS Users

MINNEAPOLIS — B.I. Moyle Associates, Inc. (BIM) has released a package to provide information about the current status of CICS systems for users of IBM's DOS/VSE and CICS/VS.

BIM-Odis also displays DOS, Vtam and DL/1 status information, the vendor said. Both detail and summary displays are provided as well as analytic displays for problem determination.

Fifteen CICS/VS and eight DOS/VSE tables and control blocks are formatted in detail, according to the vendor. Additionally, a computer memory display facility permits access to other areas by address or by name of the storage area. Memory may also be altered using BIM-Odis.

The package can be used in a unattended mode called "Watchdog," the vendor said, where it will periodically examine the CICS system for potential problems and report them to a CRT terminal, terminal printer or operator console.

The package is available for a purchase price of $2,200 or can be leased for $1,100/year or $110/month.

BIM is located at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

'Citicontroller' Fits Decsystems

SYOSSET, N.Y. — Tekkon Computer Services Corp. has introduced a version of Citicontroller, its financial consolidation, reporting and analysis package, to run on Digital Equipment Corp.'s Decsystem-10 and -20 CPUs.

The package is said to be a flexible report writer that allows for clear presentation of financial information. It also provides a choice of standardized or user-defined organizational structure and chart of accounts.

The system is available for $40,000 from Tekkon Computer Services Corp., Suite 114 W, 6800 Jericho Tnpk., Syosset, N.Y. 11791.

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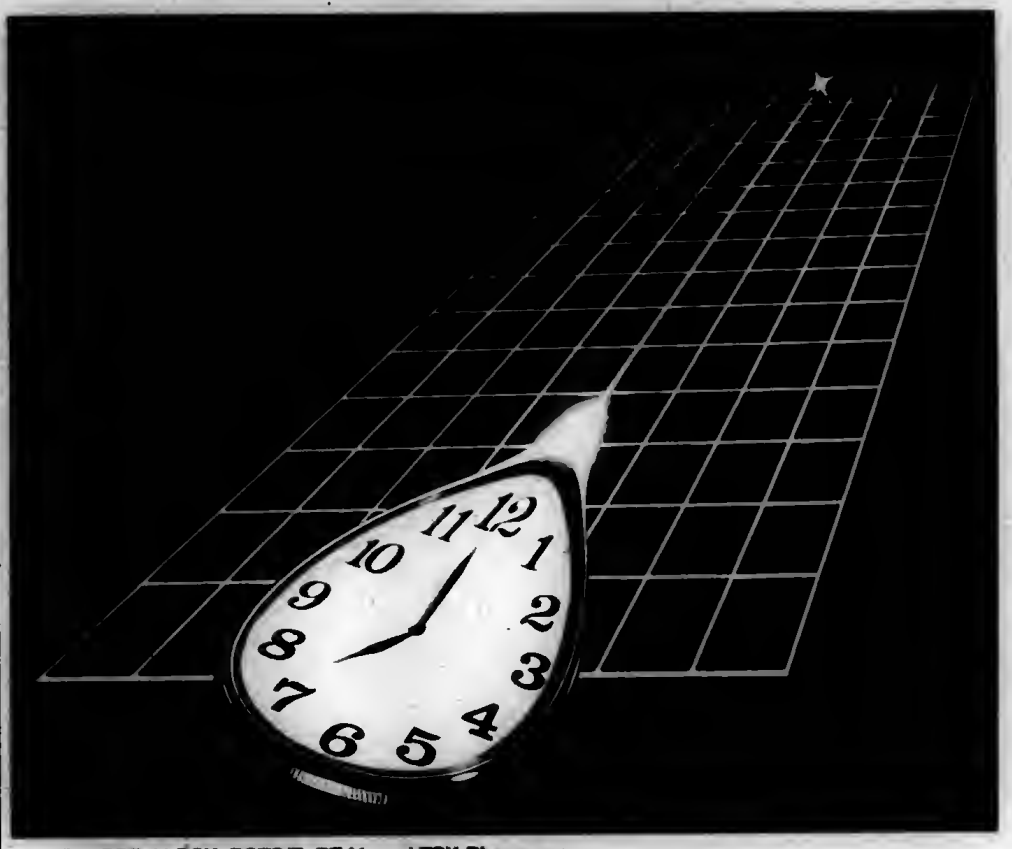

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Micronotes

Software Arts, Inc. has introduced TK!Solver, a software program designed to solve engineering and business problems without programming.

Software Arts will produce and market the TK!Solver program and will offer the program and applications packages for use on the IBM Personal Computer and Apple Computer, Inc.'s Apple II microcomputer later this year.

Professionals reportedly can use TK!Solver to develop their own customized solutions or models or can choose to use Software Arts' applications packages containing predefined models for various fields. Each model is said to have preset equations, tables and values relevant to individual problems.

In mechanical engineering, for instance, TK!Solver applications packages can be used to solve several common problems, such as tensile and torsion stress analysis, piping layout and design, sizing of hydraulic and pneumatic actuators, beam deflection and cost efficiency. In investment management and analysis, TK!Solver's models reportedly include one for product costing and pricing, lease vs. purchase analysis and balance-sheet analysis. In education, the software can be used for teaching any concept of high school science that involves mathematical description, the vendor added.

The basic TK!Solver program is available for $299. The packages, including an average of 12 models, are priced between $50 and $100.

Software Arts is headquartered at 675 Massachusetts Ave., P.O. Box 827, Cambridge, Mass. 02139.

Virtual Microsystems, Inc. (VMI) has released a VAX native version of its simulator for Digital Research, Inc.'s CP/M operating system that is said to link Digital Equipment Corp. VAX superminicomputers running under VMS or Bell Laboratories Unix operating systems to software developed for microcomputers. Bridge is said to build a 64K-byte CP/M environment and create a virtual microcomputer to allow VAX users to have the flexibility of a personal computer. Users can share files, operate in a time-sharing environment and use existing high-speed peripheral and fully supported equipment, the vendor said. Bridge eliminates the need to support, connect and duplicate terminal, floppy disk drive printers and modems. VAX users can read and write CP/M standard diskettes on DEC RX01/RX02 floppy disk drives and transfer CP/M files to and from the VMS or Unix file system, according to the vendor. Priced at $3,500, Bridge is available from VMI at 2409 Telegraph Ave., Berkeley, Calif. 94704.

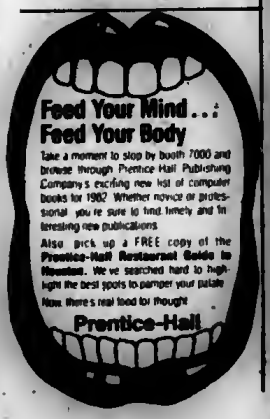
Hewlett-Packard Co. has announced several word processing packages for its HP-87 personal computer. Developed by Peachtree Software, Inc., the packages include Peachtext, the word processing package ($500); Peachcalc, an electronic spreadsheet ($375); Mailing List Manager ($375); and a Spelling Proofreader ($300). HP is based at 3000 Hanover St., Palo Alto, Calif. 94304.

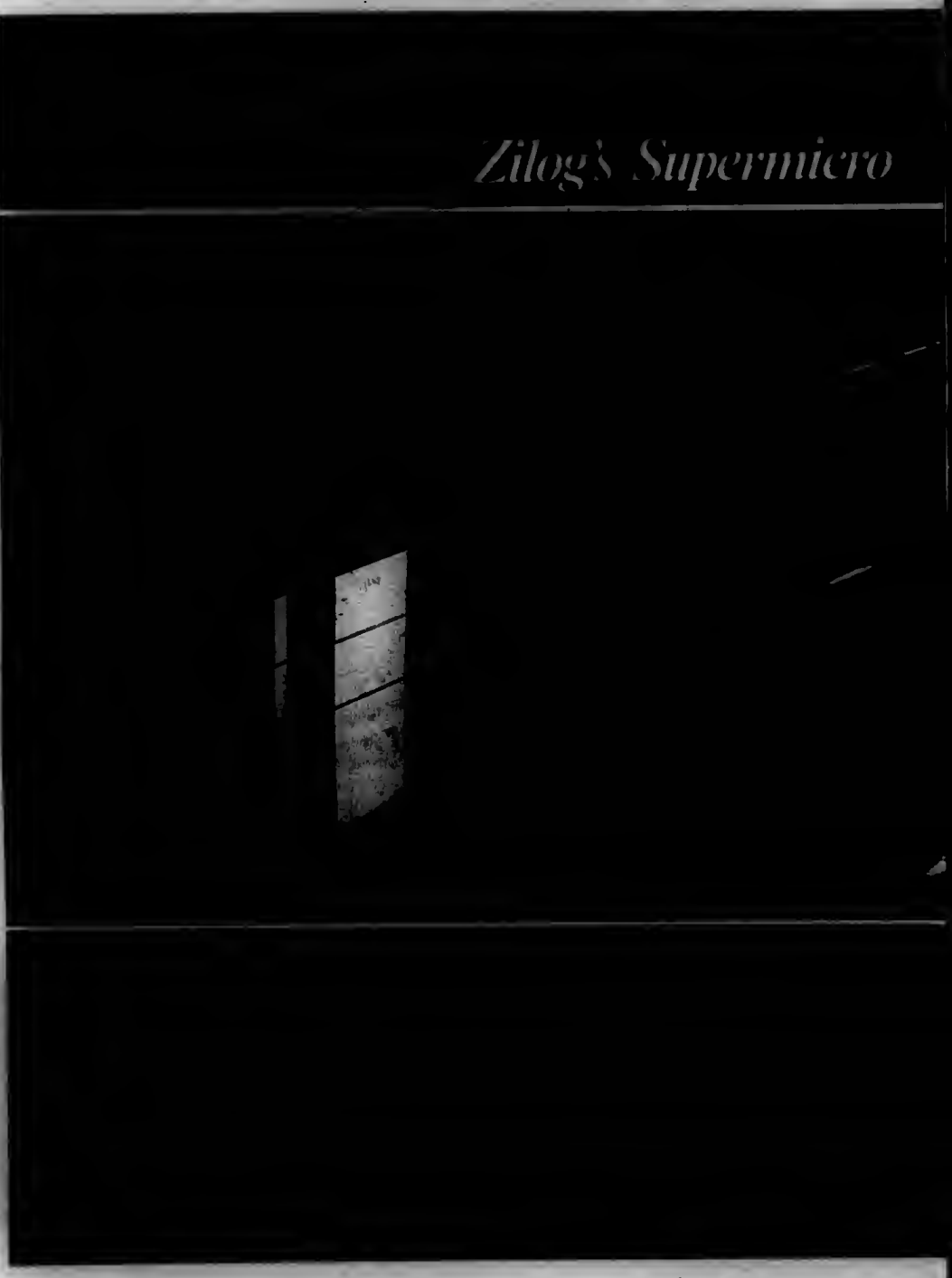
Ferox Microsystems, Inc. has converted its Mini-DSS/Finance, Graphpower business graphics and its Logon communications software packages to run on Digital Equipment Corp. Professional 325 and 350 personal computers. The three packages can be run together as one package, the vendor said. When combined they can be used to create a distributed processing-based corporate financial modeling system with time-share-based features, but at a lower cost. Mini-DSS/Finance will be priced at $1,500, Graphpower at $299 and Logon at $150. Ferox Microsystems is located at Suite 611, 1701 N. Fort Myer Drive, Arlington, Va. 22209.

Systems Plus, Inc. has added an electronic spreadsheet program compatible with Digital Research, Inc. CP/M- and MP/M-based systems to its line of business software products. The Wedge package is said to generate text files that can be edited with a word processor or generate a printed report with the result or formulas for calculating the results. Priced at $295, the package is available from Systems Plus at 1120 San Antonio Road, Palo Alto, Calif. 94303.

Visicorp has adapted four of its software packages to run on the IBM Personal Computer, providing financial modeling, recordkeeping, trend analysis statistics, charting and graphing. The packages include Visifile, Visitrend/Plot, Visiddex and Desktop/Plan programs. The packages are priced at $300, $300, $250 and $300, respectively. Visicorp also has made available finished, generalized financial models for its Visicalc electronic spreadsheet program. The Visicalc Business Forecasting Model may be used for forecasting and analyzing businesses and may be customized, the vendor said. It is available for the Apple Computer, Inc. Apple II microcomputer. The price of the software is $100 from the vendor at 2895 Zanker Road, San Jose, Calif. 95134.

Comsen, Inc. has introduced The Data Handler for the IBM Personal Computer. It is said to keep files of data, add, change or delete data from thet file and perform calculations and print reports to present the data or calculations in the format desired. The package is available for $250 from the vendor at 20-A Erford Road, Lemoyne, Pa. 17043.





CA Unveils Dasd Management Tool

JERICHO, N.Y. — Computer Assoicates International, Inc. has announced Release 1.1 of Ca-Dynam/DMF, a direct-access storage device (Dasd) management package for IBM OS/VS1 and OS/MVS systems.

The package is designed to maintain disk drive efficiency by automating data set migration and restoration, the vendor said.

Release 1.1 supports IBM 3375 and 3380 disk drives and provides Vsam support and a capability to accommodate a multisystem shop, the vendor said.

The package costs $6,500, the vendor said from 125 Jericho Tnpk., Jericho, N.Y. 11753.

Informatics Adds File Support To 'Trans IV' Application System

CANOGA PARK, Calif. — Informatics General Corp., formerly known as Informatics, Inc., has added extended file support facilities and enhanced security controls to its Trans IV CICS application development system for users of IBM and plug-compatible mainframes.

Release 3.1 of Trans IV can now access up to 10 Trans IV libraries from one CICS/VS system. The same CICS/VS system reportedly can be used with both test and product libraries. The package also allows for separate definition of libraries for each user organization.

Security control has also been enhanced, according to the vendor. Data base administrators or security officers can write procedures that control data access through Trans IV.

Extended program function key support allows operators to invoke subsystems by pressing one key, the vendor said.

Enhanced File Support

File support has been enhanced to include automatic and procedural access to Bdam and Vsam relative record files. Files can be reached through any standard IBM access method available under CICS/VS, according to the vendor.

Release 3.1 is available free of charge to current Trans IV users who are under Informatics' Annual Improvement, Maintenance and Support (Aims) agreement. Cost to first-time users is $25,000 for OS and $20,000 for DOS, which includes Release 3.1. A DL/1 option is available for $5,000.

Informatics General is located at 21050 Vanowen St., Canoga Park, Calif. 91304.

Print Aid Fits 'Mapics'

ROCKPORT, Mass. — Para Research, Inc. has introduced for the IBM System/34 a version of the IBM application software package called the Manufacturing Accounting and Production Information Control System (Mapics).

It is said to give manufacturers using IBM Mapics purchase-order printing and history capabilities.

The package aids users in tracking and controlling their purchases from the printing of the suggested orders to the input of invoices. It interfaces with the IBM Mapics Inventory Management, the vendor said.

The package is available for $1,500 with a $200 annual maintenance fee from Para Research, Inc., Whistlestop Mall, Rockport, Mass. 01966.

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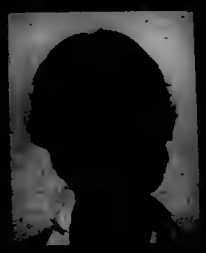

DATAMAN

Service Tracks Radiation From CRTs

OTTAWA — A service for measuring X-ray and radio frequency radiation levels emitted by CRT screens has been introduced here.

Provided by Technetronic, Inc.'a Systems Engineering Group, the service makes measurements with portable equipment sensitive to radiation emission. The company tests word processing, computer graphics and other computer terminals to see if radiation levels conform to the required emission standards.

The maximum permissable level for X-ray radiation is 0.5 millirem/hour at a distance of 5 centimeters from the surface of the CRT, the vendor reported. The detection service is available at a rate of $10/hour and a service charge of $40/hour. Technetronic is based at 325 Dalhousie St., 7th Floor, Ottawa, Ont., Canada K1N 7G2.

Bell Unveils Transaction Terminal For Retail Oil Company Sales

CHICAGO — AT&T unveiled a transaction terminal here recently to link major oil companies with their retail service stations. Verification and recording of credit card purchases is the major application of the Transaction III terminal.

The terminal is one of three components comprising the Petroleum Retail System 2000 (PRS 2000). The other two are a printer and Data Station Controller (DSC).

Tariffs covering all three items will be filed next month in Missouri, Oklahoma, Texas and Georgia, an AT&T spokesman said, adding that these tariffs will be followed shortly by others. The monthly charge for the terminal will be $95; for the printer, $50; and for the DSC, $500.

Private-Line Facilities

The Transaction III terminal communicates with an oil company DP center via private-line facilities. Between the terminal and the computer is the DSC, which can interface with up to 96 terminals. The controller provides protocol and speed conversion; it also polls the terminals, using a polling list downloaded from the DP center.

Other DSC functions include the ability to perform diagnostic self-tests and report the results to a host computer.

Initially, the DSC will communicate with the host at 1,200 bit/sec using an asynchronous protocol or at 2,400 bit/sec using 2780 synchronous protocol. By the end of this year, the spokesman said, the DSC will also support 3270 synchronous protocol. AT&T plans to introduce "other products later on" that would permit packetization of messages between the DSC and the host computer, he added, apparently referring to the Bell Packet Switching Service (BPSS) which the phone company hopes to put into operation by next January. The BPSS proposal is pending before the FCC.

Other Areas

The Transaction III terminal can be used in any other industry where a significiant percentage of the sales transactions involve use of credit cards, the spokesman added. "We're looking at these other areas," he added, but declined to be more apecific.

The Transaction III terminal includes a credit card reader, keyboard and sequential instruction lights to guide the operator through the data entry operation. The reader scans the magnetic strip on the credit card as the latter is passed through a scanning slot.

If the card lacks a magnetic strip, the information can be entered into the keyboard. In most cases, however, the only information that has to be keyed in is the amount of the sale.

The printer, which is connected directly to the terminal, provides a hard-copy record of each credit card transaction. It can accommodate a wide range of document formats, provides up to four clear copies, reproduces uppercase and lowercase alphabet characters, numeric characters, and special symbols. The printer types 1.2 line/sec and forms may be inserted from either the front or the right side. Lines on the paper tray aid alignment. When the message is printed, the form is automatically released

Introduction of the new system followed a year-long field trial involving 30 Chevron Oil Co. service stations. At a press conference announcing the new system, AT&T Assistant Vice-President William P. Stritzler said PRS 2000 could save the petroleum industry up to $250 million annually, or 15% to 20% of the cost of all credit card transactions. The savings would come mainly from elimination of "float," which, according to the AT&T official, amounts to $3 billion at any given time and costs the oil companies $480 million annually.

Converter Out From KMW

AUSTIN, Texas — KMW Systems Corp. has introduced a protocol converter said to send and receive Ebcdic data via an IBM Systems Network Architecture (SNA) network using Synchronous Data Link Control (SDLC) protocol.

The Series II 3770 Protocol Converter reportedly performs all required error-checking functions and data translations and outputs or inputs the data in serial asynchronous or byte parallel format to and from user-attached devices, the vendor said.

The protocol converter costs $4,250 from KMW, 8307 Highway 71 W., Austin, Texas 78735.

Transmission Control Unit Runs on IBM Mainframes

ARLINGTON, Va. — Capital Systems, Inc. has introduced a plug-compatible transmission control unit for IBM 360, 370, 30 series and 4300 systems.

The Distributed Network Processor (DNP) can attach up to 32 channels and up to 1,000 communication lines, the vendor claimed.

The DNP reportedly employs advanced bubble memory technology to house all system software. The software is generated through interactive console session and maintained within the DNP so that no host support is required, the vendor said.

Automatic transmission rate detection allows asynchronous terminals with different speeds to share a communications port. The user of a terminal can independently select any application in one or more host computer, permitting the user to share one terminal across many applications, the vendor said.

The transmission control unit is available for a starting price of $35,000 from Capital Systems, Inc., Suite 1406, 1235 Jefferson Davis Highway, Arlington, Va. 22202.

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POS/COM Upgraded for IBM 5260 System

New York — Computer Dynamics, Inc. announced that its Point-of-Sale Communications System (POS/COM) now supports communications with up to 1,000 IBM 5260 POS terminals.

POS/COM is able to accomplish this because it can transmit data over up to 100 communications lines simultaneously, the vendor explained. The IBM 5260 POS System consists of a 5265 control terminal and a cluster of up to 10 5266 satellite terminals. POS/COM has the ability to send to and receive data from the 5260.

Should a data transmission or I/O error occur, the communications system also features a restart/recovery function that enables the system to pick up where it left off, the vendor claimed.

POS/COM runs under all versions of IBM operating systems running on 360, 370, 3030 and 3080 series and 4300 host computers.

The price of POS/COM ranges from $8,000 for the single-line version to $30,000 for the multitasking version that supports up to 100 lines or 1000 POS terminals. Computer Dynamics is in Suite 407, 390 Fifth Ave., New York, N.Y. 10018.

Micro-Based Local Net Backs Most Interfaces

DENVER — The Starnet Data Systems Division of Protex Industries, Inc. has introduced a microprocessor-based local-area network said to support most industry standard interfaces.

The Starnet II supports the following interfaces: RS-232C/V.28 serial, IEEE 488, RS-449, TTL Centronics Data Computer Corp. and Data-products parallel, A/D, D/A and current loop. Custom interfaces are also available.

The network features 16 ports with the capability of expansion through connections with other Starnet IIs. It also allows dynamic reconfiguration of devices within the network.

Other features include on-line status report, network security with special privileges assigned by the system operator, soft selectable bit/sec rates, transmission speed mismatch compensation and code set conversion.

Remote devices are served by autodial/autoanswer integral Bell Laboratories 103- and 212-compatible modems. Each port will buffer up to 256 characters.

Installation is said to be eased because the network uses existing cables in most instances. Utilization is accomplished through application programming.

Each customized unit, including installation at site, is priced at $19,495, Starnet said from 1331 W. Evans, Denver, Colo. 80223.

Intel Replaces Three Boards With One

HILLSBORO, Ore. — Intel Corp. has unveiled a single-board computer said to provide intelligent, modular communications processing.

The ISBC 88/45 Advanced Data Communications Processor board reportedly replaces the three boards previously required for comparable communications processing power.

Using very large-scale integration intelligent circuits to provide advanced data communications channels, the board provides three synchronous data link control and high level data link control half/full duplex channels.

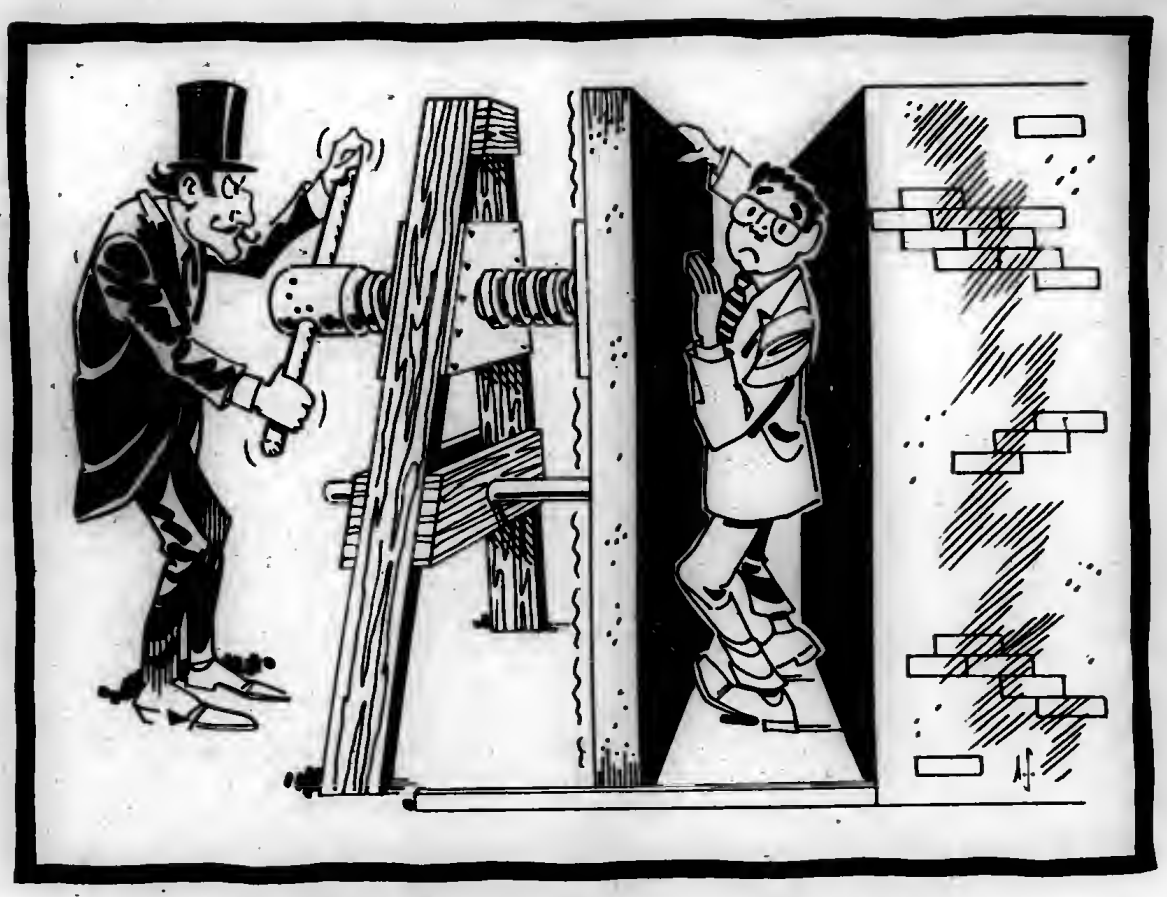
The board costs $1,895 from Intel at 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97123.

Network Offers File Transmitter

PALO ALTO, Calif. — Nestar Systems, Inc. has announced that its Cluster/One networks can now transmit files to each other using the firm's File Transfer Server (FTS) software and standard communications facilities.

FTS is said to run on any 64K-byte Apple Computer, Inc. Apple II station.

FTS costs $995 from the firm at 2585 E. Bayshore Road, Palo Alto, Calif. 94303.



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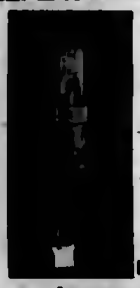

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Control Data Corp.	9766	CDC	Micro Computer Systems Corp	112	CDC
Control Data Corp.	9768	CDC	Micro Computer Systems Corp	114	CDC
Control Data Corp.	9768	CDC	Perkin-Elmer (Interdata)	8/44-800/-801	CDC
C11-48 (Honeywell Bull)	9766/3800 300	CDC	Perkin-Elmer (Interdata)	-803/-803	CDC
C11-48 (Honeywell Bull)	CDC Phoenix (D 160)	CDC	Perkin-Elmer (Interdata)	8/45-604 to 607	CDC
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Computer Automation	DEA 32	CDC	Prime	400 System	CDC
Cromemco Library Services		CDC	Prime	400/550 System	CDC
Dasmate	10-1, 20 -30, -40	CDC	Prime	4341	CDC
Digital Equipment Corp. (DEC)	RM05	CDC	System Industry	9500-02/8321	CDC
Digital Equipment Corp. (DEC)	RM03	CDC	System Industry	9500-05	CDC
Digital Equipment Corp. (DEC)	RM07	CDC	Lynwen Computers	T16/4105	CDC
Four Phase	5001/8005	CDC	Toshiba	Phoenix	CDC
Four Phase	8000	CDC	Varian (Univac)	70-7501	CDC
Harris Corp.	5520/21	CDC	Varian (Univac)	70-7503	CDC
Harris Corp.	5530/31	CDC	Varian (Univac)	70-7505	CDC
Harris Corp.	System 500	CDC	Varian (Univac)	70-7507	CDC
Harris Corp.	1087/1880	CDC	Wang Labs	2260/-1	CDC
Honeywell	CDC 9121	CDC	Wang Labs	2260/2/015 145	CDC
Honeywell	9448	CDC	Wang Labs	2260/2260V-1 2 -3	CDC
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			Xerox	7000 System	CDC

Attention DEC users:

MTI has what you need to turn your VT100 into a CP/M personal computer.

Digital's VT 18X option can be installed on your VT100 in just 15 minutes by your MTI field service representative. It features two 180K byte 5¼" mini floppy drives in a small box. A second dual unit can be added for a total of 720K bytes.

A library of CP/M software programs is available from MTI in addition to the operating software. Choose from over 2000 programs encompassing high-level languages and popular applications.

MTI is one of the few authorized DEC terminal distributors. That's why we have the latest DEC equipment in stock, ready for delivery. And the VT 18X is going fast.

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CP/M is a registered trademark of Digital Research, Inc.

ECS Microsystems Unveils Subsystem Series, CRT Unit

SAN JOSE, Calif. — ECS Microsystems, Inc. has introduced a hard disk subsystem for mass storage and an intelligent terminal said to provide direct communications between two host mainframes.

The 5000 series of hard disk subsystems provides mass storage capabilities for file-oriented applications such as word processing, remote job entry and language compiling, according to the vendor. It can be installed as an independent desktop module or as an integrated component of the vendor's existing 4500 series of intelligent terminals.

The 5000 series can be shared by up to four ECS terminals and function as a local data collection device capable of forwarding files to a remote mainframe, the vendor said.

The 4100 Intelligent Terminal includes keyboard-selectable protocols for direct communications between two host mainframes, according to the vendor. Dual protocol options available include IBM; Burroughs Corp.; Honeywell, Inc.; NCR Corp.; Sperry-Univac; ICL Computers, Inc.; Hewlett Packard Co.; and Digital Equipment Corp.

The 4100 uses a standard RS-232C interface for synchronous or asynchronous communications at user-selectable rates from 300 bit/sec to 19.2K bit/sec, the vendor said. Full modem controls and a parallel interface is available as an option.

The 5000 series with 5M bytes and a 4500 terminal is priced at $9,800. The 4100 terminal is priced at $3,195. Both products are available from ECS at 215 Devcon Drive, San Jose, Calif. 95112.

Mux, Demux Fit TFC CPU For Wideband

WALLINGFORD, Conn. — Times Fiber Communications, Inc. (TFC) has released multiplexer and demultiplexer units, said to be compatible with the rack-mounting TFC mainframe, for multichannel wideband video transmission.

The TFC Series 500 frequency division multiplexer and demultiplexer were designed to operate as part of a fiber-optic video system, according to the vendor. The units can combine as many as five wideband analog signals for transmission over a single optical fiber.

The Model TFC-500MX Multiplexer will accept as many as five frequency modulated 70MHz signals, with a channel bandwidth of up to ± 15 MHz. Channels are frequency upconverted to separate carriers, which are combined to drive a broadband laser diode transmitter such as Model TFC-301TX Fiber Optic Transmitter.

Receiver Output

The output of a fiber-optic receiver such as the Model TFC-300RC is fed into the Model TFC-500DMX demultiplexer. The demultiplexer frequency down-converts the multiplexed carriers to separate frequency modulated 70MHz signals. Each of the 70MHz wideband FM signals from the demultiplexer will accommodate up to five channels. Each of the 70MHz wideband FM signals from the demultiplexer may be converted to baseband video and audio channels by individual demodulators such as the Model TFC-500FMD.

The units are priced at $1,100 each for two channels, $1,800 for three; $2,500 for four and $3,200 for five.

TFC is located at 358 Hall Ave., P.O. Box 384, Wallingford, Conn. 06492.

'Oh, Johnny, an Apple for Me!'

Penril Unveils Statistical Mux

ROCKVILLE, Md. — A statistical multiplexer available in four, eight, 12 and 16 asynchronous line configurations has been introduced here by Penril Corp.'a Data Communications Division.

The Penril Model TC-5 multiplexer reportedly allows reducing eight 1,200 bit/sec modems to only two and four phone lines to only one. It also features user-selectable configurations and automatic error detections and retransmission. Installation of the multiplexer is simplified because there are no internal dip switches, the vendor claimed. The system is transparent to the computer and the terminals, and configuring can be performed by nontechnical users at the front panel using an alphanumeric display for prompting.

Model TC-5 is priced at $2,075, according to Penril at 5520 Randolph Road, Rockville, Md. 20852.

Modem OKs Orders With 'Human' Voice

ANAHEIM, Calif. — Processing Innovations has introduced a modem said to verify electronic orders with a human-sounding voice. It was designed to act as an interface between a hand-held terminal in the field and the data processing center.

The Speech-Aided Modem (SAM) is said to provide a computerized voice that will respond with a positive easy-to-understand status message, either completing the transmission process or requesting another try, the vendor said.

The modem is available for $2,995 from the vendor at 10471 Brookhurst, Anaheim, Calif. 92804.

Less Expensive Than Paper Printers

COM Recorders Viable at Remote Sites

By Gerard A. Santelli
Special to CW‡

MILWAUKEE — Computer users at remote distributed sites generally have two ways to produce hard copy. They can either produce the material themselves using standard printers, or they can transmit data to a central site where it is printed and wait for it to arrive in the mail.

However, there is another alternative that formerly was considered viable only for large, centralized computing operations. That alternative is remote computer-output microfilm (COM) recorders.

The First Wisconsin Bank, headquartered here in Milwaukee, uses a remote Kodak Komstar 200 micro-image processor — located in Eau Claire, Wis. — to produce reports generated at the bank's main computing site. The bottom line is that the bank is able to shave an entire day from its distribution schedule by processing microfiche reports at a distributed site and sending duplicates to its branches.

A few years ago, the installation of a COM system at a distributed or remote processing site would have been expensive and impractical because virtually all COM recorders required a special wet-processing operation in the production of the film, which necessitated special plumbing and chemical disposal arrangements.

No Need for Chemical Processing

Now, however, most COM devices are able to produce microfilm on-line without the need for chemical processing or specialized operators. They are usually controlled by their own minicomputers and act as just another line printer in the user's computer site.

While saving time, both in report production and distribution, is a primary consideration in adopting remote COM, cutting costs is also important. For instance, when McGraw Edison decided to process its data remotely, it installed a COM recorder at its Canonsburg, Pa.-based Power Systems Division to lower printing costs for multiple copies.

Previously, everything was printed on one-part computer paper, reduced in size by a copier duplicator and then distributed to various parts of the organization. The initial plan called for handling about 150,000 to 200,000 copies per month. Un-

(Continued on Page 44)

Upgrade Means More Memory For 'Syfa' 200, 300 Systems

IRVINE, Calif. — More memory, the ability to handle more terminals and an increased on-line disk storage capacity are a few of the enhancements Computer Automation, Inc. recently announced for its Syfa 200 and 300 low-end distributed processing systems.

Effective immediately, the minicomputer-based systems are available with a choice of processors, either the 750-nsec nonerror checking and correcting (ECC) Model I or the 550-nsec ECC Model II; and increased memory, up to 128K bytes for the Syfa 200 and 384K bytes for the Syfa 300.

The systems' terminal limits have also been expanded from a maximum of four to a maximum of eight, and disk storage capacity has been boosted from a standard 32M bytes to 32M-, 64M- or 96M bytes of space.

Both systems have also been given an increased printer support as well as an expanded selection of printers ranging in speed from 30 char./sec to 600 line/min. The Syfa 300 also recently has an IBM Systems Network Architecture/Synchronous Data Link Control communications capability, a spokesman for the firm's Computer Systems Division said.

The Syfa 200 and 300 are aimed at large-scale data processing users that require a number of computer systems for discrete applications and occasional communications with a central mainframe, he added.

The Syfa 200 with a Model 1 processor, 64K bytes of memory, a four-port multiplexer, a 32M-byte disk drive and one CRT terminal costs $23,945. A similarly configured Syfa 300, but with a nine-slot chassis, costs $27,945. A 128K-byte Syfa 300 is priced at $34,445.

Syfa is located at 2181 Dupont Drive, Irvine, Calif., 92713.

Harris Magnetic Tape Drive Runs on Supermini VOS Line

FORT LAUDERDALE, Fla. — Harris Corp.'s Computer Systems Division has unveiled a high-speed, tridensity magnetic tape drive that features a speed of 125 in./sec and densities up to 6,250 bit/in. The Model 6730 was developed to run on the firm's line of superminis that operate in VOS environments.

The Model 6730 is cabinet mounted and includes a formatter/controller unit that handles both functional and diagnostic modes through a built-in microsequencer, a spokeswoman claimed. Each controller/formatter can handle up to four tape drives.

The tape unit is full Ansi-compatible, incorporates a number of patented write compensation techniques and has a full differential read for each channel. In addition, the tape drive features error detection and two-track on-the-fly error correction. A resynchronization feature, which operates in bursts, is said to reduce the probability of an uncorrectable error in an 8,000-byte data block by a factor of seven.

The drive also incorporates large-scale integration circuits, instead of standard integrated circuits, for improved reliability, the spokeswoman claimed.

Other standard features include: automatic tape loading, a vacuum-assisted capstan and a power window.

The Model 6730 costs $52,000. However, a Model 6731 slave drive — minus the controller/formatter — sells for $30,600. A diagnostic tester-exerciser kit is available for $5,950, the spokeswoman added.

First customer shipments of the tape drive are scheduled for October from Harris' Computer Systems Division at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

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Computer Identics Unveils Series of Scanners

WESTWOOD, Mass. — Computer Identics Corp. has announced a series of products that includes a line of bar-code scanners and peripherals for material handling, manufacturing and distribution applications.

The Scanstar Series product line consists of three initial devices: the Scanstar-20, -50 and -65.

The Scanstar-20 was designed for manufacturing and in-process applications with throughput rates of up to 250 product/min. In single quantities the product costs $4,400.

Material-Handling Applications

The Scanstar-50 is intended for material-handling applications and includes an integrated decoder and power supply. This product scans at up to 1,200 char./sec and can reportedly handle vertically stacked bar-code labels in a single scan. It is priced at $5,500.

Finally, the Scanstar-65 scans at up to 600 char./sec. A separate decoder can double as an intelligent controller with floppy disks and a variety of communications interface options, according to the vendor. It lists for $9,644.

The company also introduced its Computer Identics Slot Reader, an alternative bar-code device for reading job and traveler tickets, badges, documents and more. This item costs $303.

Another Bar-Code Reader

Model FCP-W-5231 is another bar-code reader designed to interface with IBM System/34 and System/38 through the IBM 5231 CRT terminal. Called the Wedge, this system includes the firm's Lightpen data entry device and provides an auxiliary asynchronous serial Ascii input port for portable bar-code readers. It costs $1,490.

Wrapping up its flurry of announcements, the company released the FCP-22A, an alphanumeric bar-code data collection terminal featuring a full alphanumeric keyboard and a 16-char. liquid-crystal dot matrix display. This product also comes with the Lightpen. It can also interface with IBM System/34 and System/38 computers via the IBM 5231 terminal and has a RS-232 mA current loop communications interface. It is priced at $1,670.

Quantity discounts are available on all products, and Computer Identics is located at 31 Dartmouth St., Westwood, Mass. 02190.

COM Recorders Viable at Remotes

(Continued from Page 43)

fortunately, in a short time that total climbed to 500,000 per month.

Now, the company has a COM recorder at its Canonsburg division that is remotely linked to the headquarters' 12M-byte IBM 3033 system. A paper impact printer is also linked to the host via a communications control system.

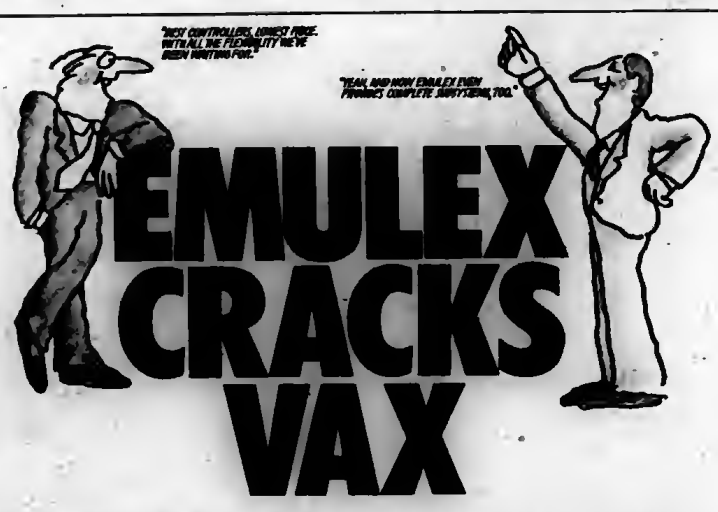
Another Significant Reason

In addition to cost, turnaround is another significant reason to have remote-site COM on-line. At Texas Instruments, Inc., for instance, the firm uses a number of laser COM units to save on expensive preprinted forms and related storage space. The COM systems are controlled by an IBM 4331 computer and appear as either an IBM 1403 or 3211 printer to the system.

Before adopting remote COM, the firm used a number of stand-alone COM systems at remote sites to process local data. However, these COM systems required wet processing, were off-line and were geared for tape-to-tape transmissions, according to the firm.

The TI COM center is part of the company's total information network, which includes 344 remote terminals, 302 distributed processors, 550 word processing workstations and more than 12,000 inquiry terminals located throughout the world and connected to the firm's Corporate Information Center in Dallas.

Santelli, a specialist in COM systems, is presently a senior marketing specialist with Kodak's Business Systems Marketing Division in Rochester, N.Y.



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Firm Announces Switching Unit

PALO ALTO, Calif. — Giltronix, Inc. has announced an automatic switching device designed to eliminate the necessity of plugging and unplugging peripherals and computers.

To use the Automatic Switching Unit (ASU), a computer or control device is connected to the common port and the peripherals are connected to ports one through seven. After the power is turned on, a command from the computer reportedly directs the ASU to select a particular peripheral.

The ASU features self-diagnostics, RS-232 switching pins, front-panel display of selected port and 110- to 9,600 bit/sec transmission rates. The three-port version costs $499, the five-port version costs $549 and the seven-port version costs $599 from the firm at 970 San Antonio Ave., Palo Alto, Calif. 94303.

Sony Micro Entry Offers 64K Bytes

MONTVALE, N.J. — Sony Corp. of America entered the desktop microcomputer field recently by announcing an 8-bit system aimed at business applications. The Zilog, Inc. Z80-based unit, dubbed the SMC-70, is priced at $1,475.

The SMC-70 offers 64K bytes of random-access memory, 38K bytes of graphics memory and a separate 32K bytes of system memory, according to Sony. Also standard are I/O interfaces that include an RS-232C serial interface, a Centronics Data Computer Corp.-type parallel port and five free ports.

The system runs under the Digital Research, Inc. CP/M operating system. Two versions of the Basic programming language are offered, one compiled (CB80) and one interpreted (Sony Basic). Sony's Basic has graphics capabilities and the system monitor for autostart and booting the operating system.

Applications packages include Visicorp's Visicalc, WP packages, a six-module accounting system package and a data base management system.

The machine will be marketed through Sony's Communications Product Co. The company will begin shipping it in September. Sony's Microcomputer Products Division is based at 7 Mercedes Drive, Montvale, N.J. 07645.

Necis Joins 16-Bit Auction By Releasing APC System

The NEC Advanced Personal Computer (APC) is aimed at businesses of all sizes. The APC reportedly can be used for planning, analysis and data base management.

LEXINGTON, Mass. — Necis Information Systems, Inc. made its bid in the 16-bit auction recently by introducing a system that features up to 256K bytes of user memory and up to 2M bytes of floppy disk storage.

The Advanced Personal Computer (APC) utilizes the firm's 8086-compatible microprocessor and is available in two models:

- A monochrome version that has a green-on-black high-resolution monitor, 128K bytes of memory, an 8-in. 1M-byte disk drive and a keyboard.
- A color model that has two disk drives and can display up to eight colors.

Both versions have a 12-in. monitor and can display 25 lines of 80 characters.

The unit is completely manufactured by Necis and is targeted directly at the IBM Personal Computer, a spokesman said.

The APC's Display

The APC's display forms characters in 8 by 19 dot matrices. Symbols can be selected from either of two character sets: One set of more than 200 symbols is predefined, while a second, larger set can be defined on a dot-by-dot basis by the user, the spokesman said. The screen's capabilities include underline and overline, vertical line for graphics applications, highlighting, inverse video and blinking.

The APC keyboard is similar to standard office typewriter keyboards and includes 22 dual-mode user-definable function keys for system and applications programs. A numeric keypad and full set of cursor control keys are also standard.

Standard I/O equipment includes a parallel printer controller and a serial communications controller, which support both asynchronous and synchronous communications at rates up to 19,200 bit/sec, he claimed.

The APC will initially support Digitial Research, Inc.'s CP/M-86 operating system and will later be available with Microsoft, Inc.'s MSDos operating system. About 20 general-purpose software packages are presently available for use on the system, each one developed by third-party sources, he explained. These packages include Accounting Plus from Systems Plus; Benchmark word processor, manufactured by Metasoft Corp.; Microplan, a business planning package from Chang Laboratories, Inc.; and the Dbase II data base management system from Ashton-Tate, Inc.

All programs are tested and guaranteed by Necis with a 30-day refund agreement if the programs do not meet specifications, the spokesman said.

For users who want to grow their own

(Continued on Page 46)

Honeywell to Add Support Capability To Small Systems

WALTHAM, Mass. — Honeywell, Inc. will include an unrestricted remote support capability, called Tacdial, on all its DPS 6/92 and DPS 6/96 32-bit small business computers shipped this year, the company announced recently. The capability will be provided at no additional cost, a spokesman said.

Tacdial reportedly provides users with the ability to perform interactive system diagnostics remotely as well as on-site.

The capability can also support secondary DPS 6/9X sites. It is part of a Systems Control Facility that consists of a standard-size logic board and related interconnect cables and minibulkhead, the vendor said. The logic board plugs into a reserved Megabus slot in the central system of DPS 6/9X computers.

Honeywell's MOD 400 Release 2.1 or MOD 600 Release 2.0 operating systems are required to support the capability, according to the vendor.

(Continued on Page 46)

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Zilog Package Boosts Power Of 8-Bit Z80-Based Systems

CAMPBELL, Calif. — Zilog, Inc. has announced an upgrade package that is said to give its 8-bit Z80-based microcomputer systems full 16-bit processing power.

The Z8000 Dual-Processor System Upgrade consists of a Z8000 microprocessor board (MPB) with a Z8001 system running at 6-MHz clock rate, 256K bytes of random-access memory and a set of Z8000-based software development tools, according to the vendor.

The MPB works with the Z80 and the Relocatable Input Output operating system running under the MCZ-1 or PDS 8000 system, the vendor said. The MPB plugs into the backplane of Zilog's MCZ-1 or PDS 8000 microcomputer systems creating a dual-processor system, according to the vendor.

When the Z8000 is not activated, the system is controlled by the Z80 with no functional changes caused by the additional processor, according to the vendor. The Z80 acts as a peripheral processor managing the host system resources when the Z8000 is running.

Based on the 6-MHz Z8001 host, the Z8000 MPB can be plugged directly into the top slot of an MCZ-1/05 with no system modification, according to the vendor. It can also be used in any vacant slot of an MCZ-1/20 or PDS 8000 system with a minor modification to the reset line.

Software tools include a screen editor, a high-level assembly language, a symbolic debugger, a Z80-to-Z8000 translator and interface software between the Z80 and Z8000. All software is supplied in source code form to allow customization for specific applications.

The upgrade package is priced at $1,495. A complete Product Development System 8000 system including the upgrade package is priced at $8,500, with multiple purchase discounts available.

Zilog, Inc. is located at 1314 Dell Ave., Campbell, Calif. 95008.

Computex Releases Micros Based on 16-Bit Processors

CHICAGO — Computex Microcomputer Systems, Inc. has announced two microcomputer systems based on 16-bit central processors.

Both processors feature 256K bytes of random-access memory, a 15-slot backplane, a 40A power supply and dual 8-in. floppy disk drives, the vendor said.

The systems utilize the Zilog, Inc. Z8001 and Motorola, Inc. 68000 microprocessors, the vendor explained.

Options for both systems include up to 16M bytes of random-access memory, Winchester hard disk drives and a line of terminals and printers, according to a spokesman for the vendor.

The firm's X-8000 is based on the Z8001 and offers eight serial I/O ports. The processor's operating system supports from one to 32 users simultaneously and up to 250M bytes of on-line media storage are available, a spokesman for the vendor explained.

X-6000 Micro-Based

A 256K-byte X-8000 costs $7,053, the vendor said.

The X-6000 is based on Motorola's 8-MHz 68000 microprocessor and features up to 64K bytes of erasable programmable read-only memory, 128K bytes of random-access memory, seven prioritized vectored interrupts and one nonmaskable interrupt, the vendor said.

The system costs about $7,099, the vendor said from 5710 Drexel Ave., Chicago, Ill. 60637.

Necis Joins 16-Bit Auction

(Continued from Page 45)

software, the firm is also offering Ryan-McFarlan Corp.'s CP/M-86 Cobol compiler — a high-level implementation of the Ansi-74 Cobol standard designed for the development of business applications.

The system supports IBM 2780, 3780, 3741, 2770, 3270 and Hasp communications protocols. The monochrome system costs $3,298, while the color version costs $4,998.

Optional features for both systems include an additional 128K bytes of memory priced at $700, an additional communications controller for $310 and a 32-bit arithmetic processing unit for $250. The system supports both a 100 char./sec 136-col dot matrix printer priced at $695 and Necis's letter-quality Spinwriter machines.

Additional details can be obtained from the firm at 5 Militia Drive, Lexington, Mass. 02173.

Honeywell Minis Gain 'Tacdial'

(Continued from Page 45)

Additional standards with the DPS 6/9X will include a VIP 7301 console VDT, the vendor said. A local auxiliary serial printer port for optional 30 char./sec or 120 char./sec hard-copy printers, two RS-422 direct-connect workstation ports — one for a system console and one for a workstation — and an asynchronous RS-232C communications port for Tacdial are included.

The DPS 6/92 and 6/96 are priced at $110,000 and $130,000, respectively.

A retrofit kit will be made available later this year for DPS 6/9Xs already installed. Further information about the DPS 6/9X can be obtained from Honeywell at 200 Smith St., Waltham, Mass. 02154.

According to ARD Study

Support Staff to Top Workstation Users

By Bruce Hoard
CW Staff

MEDFIELD, Mass. — Administrative/secretarial workers will be the recipients of the largest portion of multifunction workstation devices shipped over the next five years, according to a recent study by Advanced Resources Development, Inc. (ARD).

This support/worker segment will dominate all categories of office workers, including executives, managers and professionals.

The administrative/secretarial support workers received 47% of the 280,000 workstations shipped in 1981, the study claims. That is more than twice the number of multifunction workstations shipped to the three levels of managers combined and 1½ times the number shipped to professionals.

Entitled "Management Workstations: Markets and Strategies, 1981-1986," the study predicts that support workers will continue to lead other categories by receiving 38% of the 1,470,000 devices shipped in 1986.

In comparison, ARD predicts a 29% share of the workstation market for professionals and a combined 33% share for executives and managers. While the managerial. and professional market segments will experience faster growth rates in shipments than the support group, they will not match the administrative/secretarial volumes.

In spite of the recent emphasis placed by office automation vendors on multifunction workstations for professionals and managers, a large part of the initial investment in this equipment will be for the office support staff.

Major Factors

Major factors in determining this trend in the distribution of multifunction workstations are the long-established focus of the office automation process on the support staff and the reluctance of managers and professionals to begin using workstations themselves.

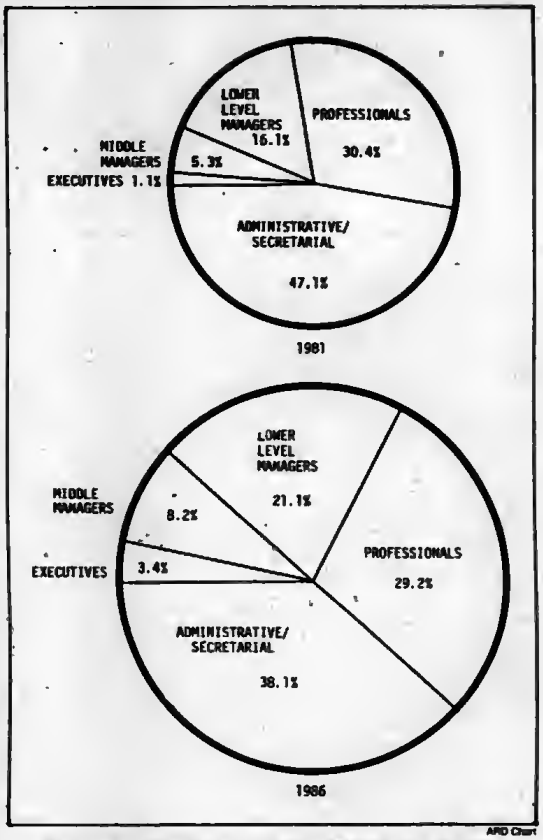
Purchasers of office equipment are still oriented toward automating the support staff. This is because it is much easier to relate increased office productivity to the more concrete tasks performed by support workers than to the more abstract improvements in managerial performance.

It is difficult to quantify the increases in productivity and the improved quality of decision making at the managerial level. The study notes that pilot projects are needed to demonstrate clearly productivity improvements before user acceptance at the executive and managerial level will materialize.

Although there is a certain reluctance on the part of executives and managers to adopt automated information support, the management workstation market is expected to grow at a healthy 40% per year through 1986.

ARD projects that more than 4,500,000 workstations valued at $25 billion will be shipped during the five year period from 1982-1986.

More information on this study is available from Advanced Resources Development, 28A Park St. Station, Medfield, Mass. 02052.



Workstation Shipments, 1981 vs. 1986 (Percent of Units)

Powertext Now Fits IBM Micro

HARRISON, N.Y. — Beaman Porter, Inc. has adapted its Powertext word processsing system to run on the IBM Personal Computer.

Originally introduced for use on Apple Computer, Inc.'s Apple II and III computers, Powertext provides editing capabilities and comprehensive text formatting, according to the vendor. It also can support both serial and parallel printer interfaces. Powertext is said to be a runtime bootable system requiring a minimum of 64K bytes of memory, two disk drives and a printer.

The system can accommodate 200K bytes/disk — 25% more data than the 160K bytes accommodated by standard IBM software, the vendor said. If the user's system has more than 64K bytes of memory, Powertext provides extended memory for the program environment and random-access memory.

Even an unskilled typist can create formatted documents, the vendor claimed, since formats are stored in the system's style files. Texts are shaped to the style determined by the user as it is printed.

Powertext with a diskette plus a comprehensive manual/tutorial is priced at $399. The manual/tutorial is priced at $25. Beaman Porter is located at Pleasant Ridge Road, Harrison N.Y. 10528.

Letter-Quality, Graphics Features

TI Enhances Omni 800 Model 810

HOUSTON — Texas Instruments, Inc. has announced letter-quality, graphics and barcode printing capability enhancements for its Omni 800 Model 810 printer with RS-232C, parallel and current loop interfaces.

With the enhanced Model 810 users can utilize a faster data processing mode for proofing a rough draft, then print the final copy such as a business letter, proposal or other formal document in one of the three letter-quality fonts, according to the vendor.

The Model 810 provides letter-quality printing with 23 by 28 dot matrix fonts. Users can select different letter-quality typefaces including Courier, Elite and Helvetic fonts in 10 or 12 pitch.

Graphics capabilities are said to include raster graphics, block character graphics and bar code printing.

The raster graphics mode plots at speeds up to 11,700 dot/sec with a resolution of 120 dot/in., the vendor said.

Different type fonts and pitches can be mixed in the same line or paragraph to provide emphasis or variety, according to the vendor. The enhanced 810 can print pie charts or other illustrations needed for presentations.

The enhanced Model 810 is priced at $2,295 and is available from Texas Instruments at P.O. Box 202145 H-619, Dallas, Texas 75220.

Unit Prints at 40 Char./Sec

EL SEGUNDO, Calif. — A keyboard send-and-receive communications terminal said to print up to 40 char./sec has been announced by Xerox Corp.'s Printing Systems Division.

The Model 1730, to be used primarily in offices and small data centers, features an RS-232C serial interface, a 16-byte input buffer, an expanded 2,688-byte print buffer and word processing features.

Also standard are diagnostics for host computer control and transmission rates from 110 to 9,600 bit/sec, a spokesman said. The unit also includes 128 bytes of random-access memory.

The terminal costs $2,995 from Xerox's Printing Systems Divison at 880 Apollo St., El Segundo, Calif. 90245.

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The NCR V-8500 II computer series for even better price/performance.

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The new V-8500-II Series now offers an even wider range of systems. Seven models, including a new, smaller, entry-level system and two new, larger computers, all provide virtual operation, increased memory and expanded performance.

Sharply increased price/performance — This new series now offers more power per dollar invested. More than 40 percent better than NCR's already highly competitive price/performance levels.

Lower entry level — The new V-8535-II is a 32-bit processor with cycle time of 1.12 nanoseconds and a memory of one megabyte. It employs NCR's powerful Virtual Resource Executive (VRX) operating software.

Expanded memory — For most of the enhanced systems in the new series, potential memory is increased from 50 to 100 percent. Maximum memory now ranges from one megabyte for the V-8535-II to eight megabytes for the dyadic V-8595-II.

New dyadic systems — The NCR V-8500-II Series now includes three dyadic systems. Systems that combine symmetrical, tightly-coupled dual processors in a single cabinet. Both processors share all system resources equally with continuous dynamic load leveling.

Migration Path Engineering — As always, NCR provides easy transition from one system to the next without difficult conversion of software.

For more information, just call toll free (800) 543-8130 (in Ohio, 800-762-6517). Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

NCR

98 Years Experience in Business Systems

Integrated Processing System Designed for Attorneys

MILWAUKEE — Data Retrieval Corp. has unveiled an integrated text and data processing system designed for attorneys.

The Management Information Processing System (Mips) allows the same information to be used for multiple applications requiring text processing, researching and photocomposing, the vendor claimed. Each capability uses the same information base without the redundant capture of text or control codes.

Mips supports tailored applications such as management of contracts, time, legal memoranda and litigation support; calendaring and scheduling; docket control; and outside counsel tracking and management.

It runs on a variety of IBM and compatible computers. Base configurations of hardware and software begin at $115,000, Data Retrieval said from 5600 W. Brown Deer Road, P.O. Box 23437, Milwaukee, Wis. 53223.

Sheet Feeder Offered

PHILADELPHIA — Scriptomatic, Inc. has announced the Model 401, an automatic sheet feeder that reportedly attaches to most printers.

The unit will feed paper ranging from 3.6 in. to 14 in. long and from 5.5 in. to 42 in. wide, the vendor said.

The Model 401 costs $1,595, the vendor said from 2030 Upland Way, Philadelphia, Pa. 19131.

Ergonomic Workstation Features Dumb Terminal

BURLINGTON, Mass. — An ergonomic workstation featuring a full-function, nonintelligent terminal has been unveiled here by Inforex, Inc.

The Model 9012-II workstation was designed to accommodate the company's Distributed Information Processing System 9000. This CRT offers an amber screen and standard Ascii characters on a 7- by 9-in. dot matrix with a movable keyboard engineered for comfort, according to the vendor. The screen of the workstation displays 1,920 characters in an 80-col, 24-line format. Also, a serial printer option is available for report generation.

The Model 9012-II workstation is available immediately for $1,995, the vendor said from 186 Middlesex Tnpk., Burlington, Mass. 01803.

McKey System Monitors Use Of Equipment

MONTGOMERYVILLE, Pa. — Technology Products, Inc. has introduced a microprocessor-based security, access and accountability control device for electronic office and business equipment. The system is said to find broad applications for basic security, factory equipment and professional service control.

When the McKey System is attached to a word processing system, authorized users insert a magnetically encoded plastic card. The system is programmed to recognize the user and permit use of the equipment. It can then monitor and store the usage time.

The device has 35 internal memory registers and supports 190 users, the vendor said.

It is available for $499 from Technology Products, Inc., Technology Center, 1060 Rt. 309, Montgomeryville, Pa. 18936.

VLCBX Gets Data Linkup

SANTA CLARA, Calif. — Rolm Corp. has announced that its data communications feature is available with the Very Large Computer-Controlled Business Communication System (VLCBX).

Users now can order the data communications feature on systems ranging from 1,200 to 4,000 voice and data extensions, and larger in networking arrangements, the vendor claimed.

The 32-bit VLCBX central processor incorporates a distributed data processing architecture which ties together a series of minicomputers to a single local-area network. The minicomputers are connected in a "no-master" arrangement that is said to provide distributed call processing and greater reliability.

The data communications feature costs approximately $800 per line, Rolm said from 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

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Electronics Industry Threatened By Problems in Education: Exec

By Tim Scannell
CW Staff

BOSTON — The computer and electronics industries are in trouble. This time, however, the problems exist right in our own backyard — in corporations and educational institutions — and do not directly involve the Japanese or any other foreign threat.

This is the message Ray Stata, chairman and president of Analog Devices, Inc. and founder of the Massachusetts High Technology Council delivered last week to a group of engineers and engineering managers at the Electro '82 electronics exhibition and convention. The

CW At Electro

three-day event attracted about 40,000 electronics professionals and included 1,150 products exhibited by more than 600 U.S. companies.

In his keynote address, Stata accused corporate America of taking its success and lead in technology for

(Continued on Page 56)

Forecast of Recovery For Semiconductors May Be Premature

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — Forecasts that the semiconductor industry is coming out of its recession may be premature, according to several industry pundits.

Although the manufacturers' book-to-bill ratios — the industry standard by which supply and demand for products is measured — have shown an increase in the first quarter of 1982, no one is predicting that the boom is here to stay.

Nevertheless, there are signs that at least a partial recovery is under way. Motorola, Inc., Intel Corp., Texas Instruments, Inc. and others have reported healthy sales increases recently. Motorola reported record months for orders in March and April. Chuck Thompson, the company's vice-president of marketing, is hopeful that the increase will continue, but he warned, "Customers appear to be having an upturn in their business, but we are not taking a gleeful position that everything has turned around."

That cautious position is also reflected in statements from Intel, where the first three months saw sales climb 40% and profits 155% over the depressed 1981 first quarter, and at TI, where the book-to-bill ratio rose to 3:2 recently. Anything over a 1:1 ratio means demand for products is outstripping supply.

The general industry attitude was expressed by a spokesman for National Semiconductor Corp. in Santa Clara, Calif., who asserted, "There has

(Continued on Page 57)

Senate Subcommittee Recommends Restructuring of U.S. Export Control

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Members of a Senate subcommittee investigating Soviet acquisition of U.S. high technology have recommended a wide-ranging restructuring of American export control efforts.

Stiffer penalties for violating the Export Administration Act, stronger investigatory tools for federal agents and transfer of all enforcement authority from the Commerce Department to the U.S. Customs Services are the major recommendations of Senators Lawton Chiles (D-Fla.) and Sam Nunn (D-Ga.)

Nunn directed a 14-month study of legal and illegal technology transfer to the Soviet Union, a study conducted by the staff of the Permanent Subcommittee on Investigations [CW, May 10]. The investigation and five days of recent hearings found "the Soviets dedicate substantial resources to highly focused and increasingly adept attempts to secure American technology. By contrast," the two senators said, "the American response often has been unorganized."

A major restructuring of U.S. export control activities, as proposed by Nunn and Chiles, would begin with using improved intelligence resources to determine what technology the Soviets are most interested in so that U.S. counter-efforts can be better directed. This would include better determinations of foreign availability of technology, which subcommittee investigator Glenn W. Fry said are now inadequate.

Current Defense and Commerce Department attempts to determine foreign availability suffer from lack of manpower, an inadequate data base on technology transfer and from insufficient exploitation of U.S.

(Continued on Page 55)

For Future Products

Vendors Pledge to Use Micro Line

By Brad Schultz
CW New York Bureau

NEW YORK — Several vendors said at a press conference here last week that they will base forthcoming commercial DP products on a microprocessor family announced by National Semiconductor Corp. at the same gathering. The NS16000 family includes what National Semi called "the first microprocessor with a full 32-bit internal architecture."

National Semi claimed its 32-bit chip, the NS16032, "will provide the same order of magnitude performance as [Digital Equipment Corp.] VAX and [IBM] 370" systems and executes a number of logical and arithmetic operations faster than the Motorola Corp. 68000, Intel Corp. 8086 (featured in IBM's Personal Computer) and Zilog, Inc. Z8000 microprocessors.

The NS16000 announcements cap a $38-million research and development project National Semi began in 1978. NS16000 hardware and software was developed in Israel, a spokesman said.

The press conference also featured the introduction of an NS16000-compatible family of controller chips by National

(Continued on Page 60)

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Possibly Tripling by 1991

ADL Sees World DP Market Doubling by 1986

CAMBRIDGE, Mass. — The free-world market for information processing products will nearly double by 1986 and could triple by 1991, according to a recent report from Arthur D. Little, Inc. (ADL).

Estimating the total market for information processing products at $73 billion last year, the ADL team of industry experts predicted world revenues for these products would climb to between $125 billion and $150 billion by 1986, advancing to between $190 billion and $230 billion by 1991.

The U.S. market currently provides $36 billion or about half of the total world revenues for information processng products and will grow at about the same rate as other world markets over the next five years.

The report projected industry growth at about 14% in constant U.S. dollars during the next five years, with that growth moderating to about 10% in the latter part of the decade as the user base grows larger and markets mature for such products as general-purpose and desktop computers.

The pace of technological innovation will precipitate major shifts in the relative revenue contribution of specific product types; the report explained. For example, revenues from special-purpose computers will rise from a small 1981 installed base to exceed those of general-purpose computers by 1991, the report predicted. Similarly, by the late '80s sales of multifunction workstations will begin to eclipse those of desktop computers, taking over the functions of those units. These work stations will also begin to cut into the markets for conventional DP and word processing terminals.

In addition, storage peripherals using optical as well as magnetic technology will probably surpass revenues for all other product classes later in the decade, the report said. By contrast, voice I/O systems will be slow to develop.

In the software arena, ADL predicted revenues from separately priced software will outstrip most hardware products during the decade. Software growth will average 30% through 1986, then moderate to 20% through 1991. At that time, revenues from software will amount to about $46 billion (in 1981 dollars) or 25% of the total market, up from 7% in 1981.

As for Western Europe, a shortage of trained specialists is creating a software bottleneck that can best be overcome by the development of additional standardized software, according to ADL. This phenomenon will contribute to the continuing prevalence of general-purpose computers in Europe.

On the other hand, the European market is ripe for vendors in small business systems, imaging systems and other newer peripherals. However, while European manufacturers need expanded markets to boost the profitability of their companies, increased licensing agreements between these vendors and Japanese manufacturers may create a situation where European manufacturers will become overly dependent on other industry participants, ADL said.

Japanese manufacturers, in control of more than 50% of their own market, are aggressively pursuing export markets. Japanese vendors are working to strengthen their software skills and making good headway in voice I/O technology for small business systems.

"World Markets for Information Processing Products to 1991" is part of ADL's Impact program.

Formation Lays Off 20%

MOUNT LAUREL, N.J. — Formation, Inc., a maker of 32-bit minicomputers compatible with IBM 370s, has made an across-the-board layoff of about 20% of its work force in the last month. The compsny blamed the reductions on declining orders.

Orders have been flat compared with last year, explained Arthur D. Beard, the firm's president. "We had expected sales to pick up, but we don't see it coming that rapidly," he added.

The company has three product lines — its Responsive Systems, custom-designed controllers; the Formation 4000 32-bit mini line; and Forman, a materials requirements planning system.

The Formation 4000 is largely sold through OEMs, who have been delaying purchases, Beard said.

The layoffs hit 70 of the company's 320 employees in all departments. The firm, whose revenues last year were about $17 million, has reduced its sales force from 16 to 12 people and consolidated its sales force for the Forman and Formation 4000 products.

Formation has been fairly successful with helping displaced employees find jobs with local computer-related firms, Beard said. He added that the firm does not anticipate further layoffs if sales remain at current levels for the foreseeable future.

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"In general, MCBA's software is functionally superior to anything on the market today. Coupled with the ease of installation, long term reliability and high profit margin, it is the natural choice for us.

"Frankly, we are so excited about the software that we have increased our sales thrust and have taken on a full time marketing manager."

Scott Millis
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California Systems Associates

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Subcommittee Recommends U.S. Export Control Change

(Continued from Page 51)

intelligence agencies, Fry found.

Chiles and Nunn also recommended transferring all export law enforcement responsibility from Commerce to the Customs Service and eventual creation of an Office of Strategic Trade to centralize all export control activities.

It was also suggested that export control agents need additional investigatory powers, backed with stronger laws against illegal export of vital technology. It should be a crime to possess or try to obtain restricted goods for export, the senators said. Presently, a crime is not committed until such goods are actually exported.

Also, Customs should be allowed to seek court orders for electronic surveillance and given authority for warrantless arrests and search and seizure in cases of outbound cargo and persons. Additionally, racketeering statutes should be broadened to include export law violations, so that violators would face stiffer penalties, according to Chiles and Nunn.

Poorly Equipped

The present arrangement of leaving export law compliance to the Commerce Department is not working well, according to Fred Asselin, another subcommittee investigator. The department's Compliance Division "is an understaffed and poorly equipped and, in certain instances, undertrained and unqualified investigative and intelligence unit," Asselin reported.

As an example of the department's failings, Asselin said the investigation of Werner Bruchhausen's network of firms illegally diverting semiconductor technology to the Soviet Union [CW, Aug. 31], which Asselin called "one of the most important technology diversion investigations ever conducted," did not begin until two years after the network was brought to the department's attention.

Strong Criticism

In a particularly strong criticism of the Commerce Compliance Division, Asselin said that one division agent called it " 'totally ineffective' in preventing dual-use technology from being shipped to the Soviet Union and Warsaw Pact nations. He said the Kremlin's spy organization, the KGB, could not have organized the Compliance Division in a way more beneficial to Soviet interests," according to Asselin.

The major problem, the investigator said, is that Commerce "has as its major focus the promotion of domestic and international trade ... Commerce is not comfortable with the task of limiting the sale of anything."

Chiles and Nunn also recommended amending the Freedom of Information Act to try to keep sensitive data from being divulged to foreign nationals.

Mergers & Acquisitions

Metro Computer Consultants, Inc. has acquired the computer programming and computer software package marketing business of **Decision Consultants, Inc.** and **International Computer Technologies, Inc.** from the **Bunch Group** of Chicago, Ill. Metro Computer Consultants and Decision Consultants will continue to operate as separate entities and will function as divisions of International Computer Technologies, Inc.

Docutel Corp. has reached agreement with **Ing. C. Olivetti & C., S.p.A.**, to merge Olivetti's U.S. subsidiary, Olivetti Corp., into Docutel, subject to certain conditions and regulatory approvals.

Under the agreement, Docutel will issue to Olivetti approximately 2.2 million new shares of common stock together with a warrant to purchase 500,000 common shares at $32 per share, exercisable between Jan. 1 and June 30, 1984, in return for Olivetti Corp.'s $37.5 million in equity.

Upon completion of the transaction, Olivetti, which currently holds approximately 20% of Docutel's common stock, will own approximately 46% of the company.

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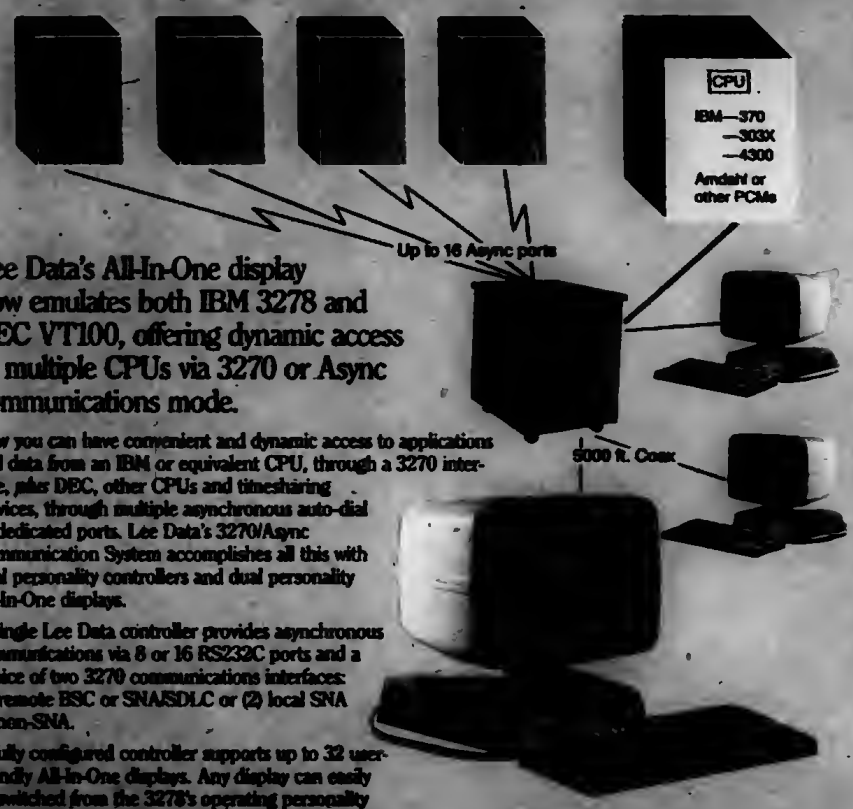

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As part of the 3270/Async system's 32-device complement, you may choose from a full line of Lee Data printers. These printers can be configured either as dedicated devices restricted to 3270 or Async applications or as shared devices dynamically assignable to either mode.

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Nickels & Dimes

Blyth Eastman Paine Webber, Inc. and Hambrecht & Quist are offering 750,000 shares of NBI, Inc. company-owned commonstock at $26.50 per share. The proceeds from the sale will be used to increase working capital, to finance additional equipment leased to customers and to purchase capital equipment.

$ $ $

Cullinane Database Systems, Inc. has begun trading on the New York Stock Exchange.

$ $ $

Data Terminal Systems, Inc. has reached an understanding with its bank group for a new $30 million, seven-year revolving credit and term loan agreement. The group is led by the Bank of New England, N.A., and includes four other banks across the country.

Industry Ills Education-Based: Exec

(Continued from Page 51)

granted. He also charged that most firms and the U.S. government have no "game plan" to sustain technological growth in the electronics and computer fields.

In the past, technological gains were directly linked to increases in government spending. The more the government poured into defense, the more it backed commercial endeavors and education, Stata said. Today, however, while the government is aggressively pumping money into the defense budget, it has curtailed its investment in technical education.

Both Japan and France have adopted a centralized plan of action for technological advancement and are presently developing "sunrise, knowledge-intensive industries," he explained. These industries encourage continued education and foster lifelong career goals.

The U.S., on the other hand, has concentrated on nurturing slow-growing "sunset" industries — ones that focus on capital formation as the key to increased productivity — and prolonging the life of dying companies at the expense of higher education and fast-growing firms, he said.

Numbers Declining

According to the U.S. Bureau of Labor Statistics, while the number of qualified engineers in the U.S. will decline by about 6% each year, only 2% will enter the work force. Added to this, the need for additional employment in the electronics industry is expected to grow from 2% to 5% each year.

While the U.S. presently has the lead in technological innovation, it is lagging in technological education, Stata claimed. Although nearly a million bachelor of arts degrees are awarded each year in the U.S., only 6% of these are in engineering. By comparison, 20% of the degrees in Japan and 37% in West Germany are aimed at the engineering fields. In fact, one-half of Japan's elite senior civil servants and corporate directors hold engineering degrees, he said.

Stata, co-author of a forthcoming book called *Global Stakes; The Future of High Technology in America*, remarked that promoting and increasing engineering education should be a top U.S. priority. A number of companies have already taken the lead in boosting educational efforts by contributing 2% of their research and development expenses to universities that offer engineering degrees. However, while defense R&D has grown by $4 billion and will reach $22.6 billion in 1983, National Science Foundation research funds have been cut.

Further Guarantees

As further guarantees for engineering growth, he suggested:

- A boost in productivity by 10%, which would be equivalent to adding 14,000 to 28,000 more workers to the current 140,000-member work force.
- A commitment to lifelong education by both engineers and managers.
- Giving senior technologists in an organization more power to influence corporate policy and affect changes.

Stata asked that engineers take more pride in their profession and promote engineering as a career. "The facts are that engineering is not a prestigious profession in America," he said.

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Universal Data Systems

Forecast for Semiconductors May Be Premature

(Continued from Page 51)

been an improvement in our book-to-bill ratio, which we think is due mainly to inventory fill-in as distributors' supplies run low. This near-term buying may bring about a recovery which is sustainable, but we are not sure."

One of the major reasons for the uncertainty is that the order increases have not been coming from the mainframe and minicomputer manufacturers — a traditional mainstay of the chip industry, which accounts for between 35% and 40% of market demand.

John Geraghty, a security analyst with Dean Witter Reynolds, Inc. in New York, commented, "The major variable is these mini and mainframe companies. While personal computers and the video games market is doing well, we are not seeing an increase in demand for chips from the likes of Burroughs Corp., NCR and [Sperry] Univac."

This, Geraghty argued, is because mainframe companies, being responsible for large capital budgets, have not seen a substantial increase in demand for their own products.

Sustainable Recovery

One thing that would make a sustainable recovery among the semiconductor companies more apparent is an upturn in the economy in general and interest rates in particular. A spokesman for National Semiconductor said that "as long as interest rates remain high, we are not expecting any long-term recovery. Also, productivity is way down and unemployment is high. We would like to see some economic indicators move before we start getting excited."

Nevertheless, there are some hopeful signs. National Semi, for instance, has reported an increase in the waiting period for certain parts from around 12 weeks to 18 weeks, and stock prices for most of the semiconductor manufacturers has risen between 30% and 50% over the past three months.

For example, Intel's bottom price in January was $21; by mid-May it had risen to $33 per share. Similarly, National Semi saw its share price rise in the same period from $15 to $22.

Geraghty explained that "if demand for products continues to increase, prices should decline less dramatically than they did last year, enabling the semiconductor companies to stay in better shape even without too much of an economic recovery." In 1981 the bottom fell out of prices in the semiconductor market, causing several companies to slim down their labor force and go on part-time work.

The growth that has taken place in the sector also seems to vary with the industry segment for which they are designed. For example, Advanced Micro Devices, Inc., specializing in high-performance chips, has seen a growth in its European market, although it is not clear if this is due to inventory rebuilding or sales of new equipment.

The company has reported record sales to distributors over the past two quarters with increases in the order of 20%. There have also been gains among the smaller users such as terminal manufacturers, makers of telecommunications equipment, instruments and video games. Large-scale integration bi-polar memory products are most in demand.

More Companies

At Motorola demand increases have been spread across its 28 product lines with 64K- and Nmos memory products doing best, according to the company spokesman.

MOS memory and random-access memory products have been most popular at TI in recent months.

TI predicts that this year the world market for integrated circuits will increase by 10%, climbing to a 20% growth rate for the decade as a whole.

Meanwhile, the question that most consumes industry analysts is whether the recession that so shocked semiconductor vendors is at an end.

WHICH TWIN HAS THE TANDBERG?

The only true ergonomic terminal in the world.

If your terminal operators are getting eyestrain, headaches, stiff necks and bad backs, chances are you haven't yet heard of the Tandberg Data Terminal. Tandberg Data manufactures the only terminal in the world which meets the stringent requirements of the German ergonomic standard. This means Tandberg terminals don't just tilt—they tilt, swivel, raise and lower to fit all size people, in any room light at any angle. Our keyboard doesn't simply detach—it's a low profile work of art so slim it can be used in complete comfort on a standard desk. And the non-glare keys are shaped for fingertip efficiency.

The luminance from our 15 inch "green" screen is adjusted to the 1:4 ratio with surrounding light which is needed to assure human comfort and health. The screen is treated to reduce glare and a unique feature, Equilite, displays both horizontal and vertical lines with equal intensity ensuring readability.

The Tandberg terminal is designed for the office of the future with a beautiful, compact housing and a finished back with no unsightly cables. When you see the Tandberg you'll realize why no other terminal deserves to be called ergonomic.

And Tandberg's operating features are just as complete. The Tandberg terminal is equipped with "soft-switches" which allow operation modes to be stored in non-volatile memory (EAROM) and changed from keyboard or line. PUSH-keys let strings of commands be implemented at the touch of one button reducing time and errors. It's an operator's dream.

The Tandberg TDV 2200 family is offered in different models emulating the DEC VT100 and VT52, Honeywell-Bull Questar and VIP 7256, Datapoint 3600 and 8200, Computer Automation CRT II, IBM 3101, Data General 6053 and D200 and others. An advanced performance model is also available for the development of application-tailored OEM terminals. So don't put up with a pain in the neck. You can increase efficiency, productivity and operator morale with a true ergonomic terminal—the only true ergonomic terminal in the world from Tandberg Data. Call or write today to: TANDBERG DATA, INC., P.O. Box 99, Labriola Court, Armonk, New York 10504. Telephone: (914) 273-8400 Telex: #137367 Tandberg Armk.

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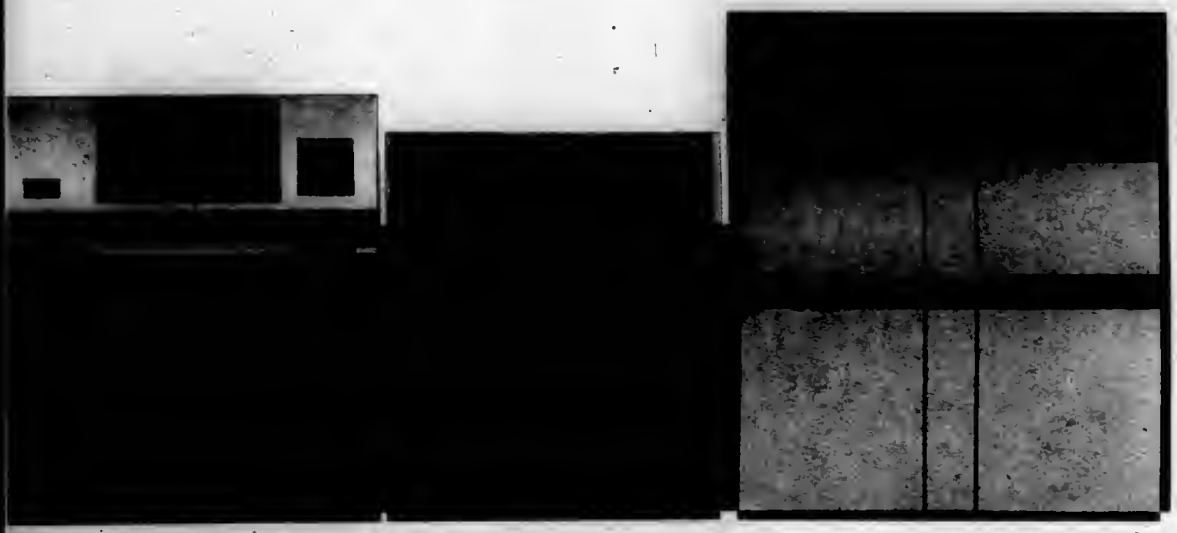
WHICH IS FASTER,

A 4300 CPU OR STC PERIPHERALS?



YES!

It's a win-win proposition. Your 4300 CPU will run faster when attached to STC disk, tape, and printer subsystems. That's because STC's intermediate-system peripherals offer advanced-technology features and functions that simply are not available on your present equipment.

For example, you may choose CKD or FBA disk subsystems with dual-port and high-speed actuators to speed I/O response.

You may choose a family of dual- or tri-density tape subsystems to speed sequential processing and to slash time and manpower from backup/recovery cycles.

You may choose a family of microprocessor-controlled printers with the combination of speed and print quality to meet your objectives.

Each of these subsystems is designed to meet the special requirements of the intermediate-system environment. And each shares the heritage of performance, reliability and worldwide service that has made STC the industry leader in large-system I/O.

If you're interested in improving the price performance of your 4300 system, contact your local STC Marketing Representative for more details. Or call Storage Technology Corporation, 2270 So. 88th Street, Louisville, CO 80027. Phone (303) 673-4063.

Storage Technology Corporation

Supershorts

Apple Computer, Inc. has filed suit in U.S. District Court in eastern Pennsylvania against Franklin Computer Corp. of Pennsauken, N.J., for patent infringement, copyright infringement, unfair competition and misappropriation. The suit charges Franklin with copying Apple's computer programs in the form of diskettes and computer components known as read-only memory (ROM). Apple is seeking preliminary and permanent injunctions against the manufacture or sale of Franklin's products, in addition to the profits, if any, from Franklin's sales. According to Apple, copying these programs has enabled Franklin to produce a computer known as the ACE 100 which can run all programs available for Apple II at a small fraction of the investment made by Apple in developing the Apple II and its software. The lawsuit also claims that Franklin's advertisement of plug compatibility with the Apple II is misleading because the ACE 100 does not meet FCC rules for personal computers, required due to potential interference with TV reception.

— — —

Kennedy Co., a subsidiary of Allegheny International, has purchased the 8-in. Winchester disk product line and manufacturing operations in Los Gatos, Calif., from BASF Corp., Bedford, Mass. The transaction includes the assets, work in progress, spares, inventory and designs, which will allow Kennedy to continue to supply drives to the existing customer base. Kennedy also acquired the rights to manufacture and market the BASF 5½-in. disk drive in the U.S. under license from BASF in Aktiengesellschaft, West Germany. Terms of the agreement were no disclosed.

— — —

Graphic Scanning Corp. has acquired all the outstanding stock of California Satellite Systems, a company providing pay-TV services to subscribers in the Sacramento, Calif., area. California Satellite shareholders will receive shares of Graphic Scanning based on the number of subscribers to the pay-TV system. The value of the transaction is in excess of $7 million.

How to do more with less in DP/MIS departments

At the same time that top management is expecting more and more from its MIS/DP department, that same management is being pressured to cut back on costs. This means that DP/MIS managers are being given two seemingly conflicting tasks: Use MIS assets to increase the company's competitive edge and keep market share and revenues up *and*, at the same time, cut back on MIS costs to insure profitability.

The dilemma is that the DP/MIS executive has no real recourse other than to try and meet both expectations. *Computerworld's* July 26 Special Report, "How to Get More DP for the Dollar" is geared toward helping DP/MIS people to maximize productivity while saving money. You'll get tutorial essays, accounts of user experiences, applications stories, articles — all designed to help you do more with less. You'll be getting the most up-to-the-minute information on:

- *Third party maintenance and leasing*
- *How training can be used to save $$$*
- *Service bureaus vs. in-house purchase of computers*
- *Software: Buy it or write your own?*
- *Micrographics vs. optical disks*
- *Automated space management software*

You'll get stories from users, vendors, consultants and other industry experts to cover every aspect of increasing productivity while cutting costs. *Computerworld's* July 26 Special Report, "How to Get More DP for the Dollar" is one you literally cannot *afford* to miss.

And if you sell to DP/MIS departments — especially if you sell cost-saving applications — here's where your prospects will be the week of July 26 — reading *Computerworld's* "How to Get More DP for the Dollar." You've got until July 9th to get your ad into this CW Special Report that will reach more than half-a-million computer-involved readers (including 114,408 paid subscribers, ABC 6/30/81).

Call your *Computerworld* salesperson for all the details. Or, to reserve space immediately for your ad, call Frank Collins at (617) 879-0700.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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SAN FRANCISCO/Bill Hanley, Barry Millman, Ruth Gordon, Elissa Dunn, (415) 421-7300
LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Ross, Dalton Pendergraft, (714) 536-6400

Micro Line Introduced

(Continued from Page 51)

Semi and Schlumberger, Ltd.'s Fairchild Camera and Instrument Corp. subsidiary. The two firms jointly developed this F16000 controller family and will collaborate in marketing the chips, which include:

- An intelligent program controller.
- A CRT controller.
- An X.25-compatible packet switching controller.
- A multiple protocol controller.
- A controller for local-area networks that meet the 802 standard being drafted by the Institute of Electrical and Electronics Engineers.

At the press conference, Digital Research Corp. declared it will develop a multitasking version of its CP/M — presently the most widely installed microcomputer operating system — for a 16-bit member of the NS16000 chip family, the NS16016.

Datapoint Corp. said it will offer DP and office automation products featuring NS16000s; Schlumberger's Applicon subsidiary swore it will put National Semi's new 32-bit chip in intelligent workstations for computer-aided design and manufacturing (CAD/CAM) applications; and a leading West German minicomputer vendor, Dietz Computer Systeme, pledged commitment to NS16000s in forthcoming systems.

Also at the gathering, Concord, Mass.-based Whitesmiths Ltd. announced it will supply C and Pascal language compilers for the NS16032 in first quarter 1983 and will support implementations of its own Idris operating system on the NS16032.

Translation Systems, Inc. of Allston, Mass., announced it will market NS16032-compatible software, including a version of Bell Laboratories' Unix operating system, plus Cobol, Fortran 66, Fortran 77, Pascal, C, Ada, PL/I, PL/M-86, RPG-II, Pearl and Coral 66 compilers.

Other Pledges

Other pledges of NS16000 support came from Wichita, Kansas-based Ebnek Computing Systems, Acorn Computers, Ltd. of Cambridge, England and Tecsi-Software of Paris.

National Semi said the 16032 executes a "multiply register to register" instruction in 8.3 μsec, compared to 43, 115.2 and 85.75 μsec for the 68000, 8086 and Z8000 chips, respectively. The 16032 performs "move register to register" in 0.3 μsec, the vendor maintained, compared with .5, .8 and 1.25 μsec for the 68000, 8086 and Z8000 chips, respectively.

The 16032 executes a "move memory to register" instruction in 1.4 μsec, National Semi declared, compared with 2, 6.8 and 4.25 μsec, respectively, for those three competitive chips. A "move memory to memory" instruction reportedly takes 2.4 μsec in the 16032, compared to 3.75, 14 and 8.5 μsec for those three chips.

"Add memory to register" was said to take 1.5 μsec, compared to 2.25, 7.2 and 5.25 μsec, respectively, and "compare memory to memory" was said to require 2.6 μsec vs. 4, 14 and 9.5 μsec, respectively.

The NS16032 microprocessor is priced as low as $162, the spokesman noted.

NCC '82
Advancing Professionalism
A 'Computerworld' Preview of the National Computer Conference

June 7-10
Astrodomain
Houston

CW Photo by S. Blakeney; Cover Design by H. Ring

AT&T's Olson to Present Keynote Address To Open National Computer Conference

HOUSTON — Presenting the keynote address at the opening of the 1982 National Computer Conference here next Monday will be James E. Olson, vice-chairman of the board and e director of AT&T.

Olson started his career as e splicer'e assistant with Bell System'e Northwestern Bell Telephone Co. in North Dakota. Rising through the management ranks of various Midwestern Bell operating companies, Olson became executive vice-president of AT&T in 1977.

Currently Olson is responsible for organizing the companies being divested by AT&T through which Bell plans to market its products and services. Having been with Bell since 1944, Olson will provide some historical perspective on the company during his keynote address, which starts at 10 a.m.

During the four-day convention, leaders in government and industry will address the conference'e three plenary sessions, the purposes of which are to provide unique perspectives on challenging issues of the decade. These sessions are set for Tuesday through Thursday from 12:15 p.m. to 1:15 p.m.

Speaking at the first plenary session on Tuesday will be Theodore A. Burtis, chairman and chief executive officer of Sun Co. The title of Burtis' speech is "First Violin or Second Fiddle?"

Burtis joined Sun in 1967 as director of commercial development. He was elected to his current position in 1979 and serves as a director of the American Petroleum Institute.

Theodore A. Burtis

Gordon C. Morison

James E. Olson

Ruth M. Davis

On Wednesday, Gordon C. Morison, assistant postmaster general of the U.S., will be the featured plenary session speaker. He will speak on "Computer-Originated Mail and the Postal Service."

Morison will explore electronic mail and the nine-digit Zip Code as well as review the new services and programs the U.S. Postal Service has made available to customers with computer capability.

Dr. Ruth Davis, a former government official (she has served as director of the Institute for Computer Sciences at the Netional Bureau of Standards) and now the director of the Pymatuning Corp., a Washington, D.C., consulting firm, will be Thursday'a plenary session speaker. Davis' address is titled "A Computer Antidote for Our Economic Ills."

5pecialists in computer science and its applications should be heralding computers and all their ramifications as e multipurpose cure for s significant number of the country's economic ills, Davis contends.

By accelerating the use of computer applications, the U.S. can maintain its military superiority, create new jobs in computer-related fields to decrease unemployment, provide customized education and provide more accurate forecasting techniques for economic planning.

"What is standing in our way is arrogant ignorance of computers by e vast majority of our decision makers and an embarassing absence of aggressive leadership by our computer community," according to Davis.

The keynote and plenary sessions are open to all NCC attendees.

Professional Development Seminars Slated

HOUSTON — DP professionals looking to enhance their professional skills will be eble to choose from more than 17 different half- and full-day Professional Development Seminars at the Netional Computer Conference here next week.

The seminars will be given at the 5hamrock Hilton Hotel, not far from the Astrodomain where NCC is being held. The full-day sessions begin at 9 a.m. and last until 4:30 p.m. The half-day sessions will be held from 1:30 to 4:30 p.m.

The Professional Development Seminars have been organized under five different topic areas — computer graphics, communications/data security, data management, current issues in new technology and general topics.

The seminars on Monday, June 7, will include two half-day sessions — "The Computer Professional as Expert Witness" led by Dr. John Conley and James J. Marcellino, both of whom are affiliated with Gaston 5now and Ely Bartlett, and "Creating Receptivity to Technology" with Gloria J. Gery of Gery Associates. A full-day session on "Data Base Management in the '80s" will be led by James A. Larson of Honeywell, Inc.'s Corporate Technology Center.

Three full-day seminars will be offered on Tuesday, June 8: "Computer Graphics for Management Information Systems: An Overview," with Irwin Jarett, president of Irwin Jarett, C.P.A. Ltd., who will examine issues related to making business graphics useful for corporate management; "Regulatory and Legislative Developments and their Implications for Telecommunications end Data Processing," with Mary Jo Manning of Hedrick and Lane and Walter Hinchman of Hinchman & Associates, which will provide an update on new services and regulatory and policy changes in telecommunications; and "Structured Design," led by Ned Chapin of Infosci, Inc., where the process of productively developing high-quality softwsre through software engineering will be examined. Tools and techniques of structured design will be covered as well.

At Tuesday's only half-day seminar, Laurence Press of Small Systems Group will lead "Low-Cost Word Processing." A range of word processors, including personal computers, will be discussed and compared.

The next day, June 9, four full-day Professional Development Seminars wili be offered:

- "Implementing Successful Business Graphics Systems" will be led by Alan Paller of AUI Data Graphics. The session will look at key trends in computer graphics' growth and high-payoff epplications. A session highlight will be the section on justifying computer graphics to management and ensuring its acceptance.
- "Overview and Directions in Local Computer Networks," lead by Harvey A. Freeman of Architecture Technology Corp.
- "Data Analysis Techniques," with Richard C. Perkinson of Q.E.D. Information Sciences, Inc.
- "Managing, Controlling and Auditing Minicomputer Systems," led by Edward H. Murray of Management Advisory Services.

A half-day seminar on "Motivating Data Processing Personnel" will be conducted by J. Daniel Couger of the University of Colorado.

Session registration is now open for the full and half-day sessions. Each full-day seminar costs $60; the half-day seminars cost $30 each. Registrants are entitled to free entrance to the NCC exhibit floor at the Astrodomain.

Further information on the seminars can be obtained from the sponsor of NCC, the American Federation of Information Processing Societies, Inc., which is located et 1815 N. Lynn St., Arlington, Ve. 22209.

By the Way, NCC Not Free

HOUSTON — If you haven't figured it out by now, the National Computer Conference isn't free.

If you preregistered for the full conference program and exhibits, you paid $75. If you didn't get around to preregistering, the fee is $90.

In both cases the registration fee includes e hardbound copy of the conference proceedings.

Students can get into the exhibits and receive a copy of the conference proceedings for $10. Anyone can walk around the exhibit floor for $10 a day or $30 for the four days of the show.

For $25 you can ettend one day of the show. The fee includes access to all programs and exhibits.

Full-day Professional Development Seminars cost $60 each; half-day sessions cost $30. More information about registration is evailable from the show's sponsor, the American Federation of Information Processing Societies, Inc., at 1815 N. Lynn St., Arlington, Ve. 22209.

'Advancing Professionalism': NCC '82

The Fun Starts Next Monday at the Astrodomain

HOUSTON — The fun starts here, next Monday.

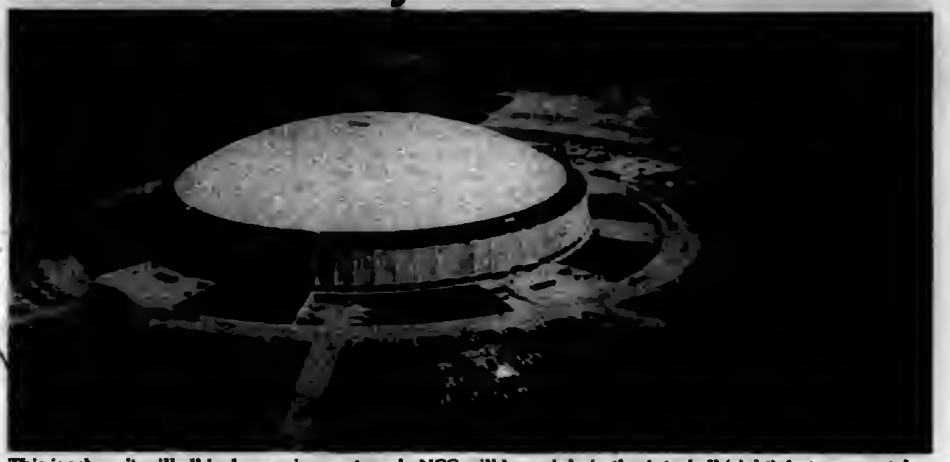
This year's National Computer Conference will be held at the Astrodomain, the complex that is comprised of the famed Astrodome, the Astrohall and the Astroarena. NCC '82 will sport 684 exhibitors showing their wares in more than 320,000 square feet of exhibit space — a fact you should know in case you want to pack your hiking boots.

By the way, since the show is in sunny, hot Houston, another fact you should know is that the exhibition hall is air-conditioned.

The theme of this year's National Computer Conference is "Advancing Professionalism," and many of the technical sessions will focus on how the DP professional's function integrates with the corporate structure. The technical sessions are divided into tracks: computer architecture, software engineering, personal computing, social and organizatonal issues, office systems, management issues/decision support systems, language and data base processing, applications of computing and Pioneer Day.

For the very knowledge-hungry, there are full- and half-day Professional Development Seminars covering things like computer graphics, communications and data security, data management, current issues in new technologies and a catch-all general category.

Like last year's NCC, this year's conference will feature one keynote and three plenary session speakers. This year's keynoter is James Olson, AT&T director and vice-chairman of the board, who will kick off the conference when he delivers his address on 10 a.m. Monday.



This is where it will all be happening next week. NCC will be mainly in the Astrohall (right), but you can take a behind-the-scenes tour of the Astrodome, home of the Houston Astros and the Houston Oilers.

Speaking at the plenary sessions will be Theodore Burtis, chairman of the board and chief executive officer of the Sun Co., on Tuesday; Gordon Morison, Assistant Postmaster General of the U.S., on Wednesday; and Ruth Davis, director of Pymatuning Corp., on Thursday. The plenary sessions will be held at 12:15 to 1:15 p.m. on those three days.

One of the features of NCC is the awarding of the Harry Goode Memorial Award, whose recipient will not be announced until Tuesday's plenary session. The award was established in 1964 to honor outstanding contributions to the information processing field. Past recipients include such luminaries as Howard Hathaway Aiken, Grace Murray Hopper and Seymour R. Cray.

NCC is one of those shows which promises something for just about everybody — as long as it's computer-related:

- An international visitors center will offer a currency exchange, interpreters and a "friend-finder mini-computer," which lists names and hotels of international visitors from the conference-goer's homeland.
- For the job-conscious, Afips is putting on a career planning seminar June 6, the day before the show officially starts.
- For movie buffs, educational films including Polaroid Corp.'a "Graphic Harmony" and the National Aeronautics and Space Administration's "Space Research and Health" will be screened.
- Afips has even gone as far as planning sightseeing tours including an evening at the famed Gilley's country and western bar, a trip to Nasa's LBJ Manned Spacecraft Center, a tour of Houston and a tour of Galveston's waterfront.

Chartered buses will be on hand to shuttle conference-goers from the Astrodomain to their hotels. And for the best of NCC '82, Afips has hired On The Spot Duplicators, Inc. to provide cassette tapes of the technical sessions.

Who Puts It Together?

All this doesn't happen by accident. Forty full-time Afips employees and some 65 volunteers have been working for the past year coordinating this year's show.

The show's two main coordinators — NCC '82 Chairman Russell K. Brown and Vice-Chairman for Program Activities Robert Stirling — have been working for the past two years naming committee leaders and readying the organizational framework that eventually results in the actual conference, according to Jim Kroell, Afips director of conferences.

Most of the volunteer personnel have been appointed at least a year prior to each show and are given on-the-job training of sorts from their predecessors, Kroell said.

The NCC Steering Committee has been communicating with session leaders and speakers for months, requiring them to submit outlines of their sobjects and, several weeks before the show, completed copies of their technical papers.

In those final weeks, Afips personnel tie down loose ends. These duties include printing of conference badges, coordinating publication of the usually monstrous hardcover conference proceedings and processing last minute preregistrations, Kroell said.

Afips Responsible for Coordinating NCC

ARLINGTON, Va. — It was not long after the introduction of the first digital computer that organizations were formed to help users exchange technical information. The National Computer Conference is part of a 31-year history of exhibitions sponsored by these types of organizations. NCC is, of course, sponsored by the American Federation of Information Processing Societies, Inc. (Afips).

Afips is a federation of 11 organizations dedicated to the various aspects of data processing. It is responsible for coordinating the information exchange among those organizations and disseminating it to the public.

It also acts as a liaison betweeen the member societies and the government.

Four of the 11 societies assist Afips in sponsoring NCC, according to Afips Executive Director Paul J. Raisig. Those four are the Association for Computing Machinery, the Data Processing Management Association, the Institute of Electrical and Electronics Engineers Computer Society and the Society for Computer Simulation.

"They [the organizations] found that they needed a more formal arrangement to sponsor NCC so Afips was brought about in 1961," Raisig said.

Afips also acts as the U.S. representative of the International Federation of Information Processing (Ifips) and publishes proceedings from its conferences. In addition, Afips is a partner in the Charles Babbage Institute, an historical society devoted to keeping track of the information processing chronology. Four Afips representatives sit on the Babbage Institute'a board of trustees.

Sixty titles are distributed through Afips Press, the publishing arm of that organization. Most publications are available to constituent society members at a discount. It also publishes such documents as statistical research reports, educational material, proceedings of special seminars and a quarterly journal, *Annals of the History of Computing*.

The Office Automation Conference (OAC) is another conference sponsored by Afips. A smaller version of NCC, OAC is aimed at the office-of-the-future audience.

The 11 organizations that make up Afips are:

- American Society for Information Sciences
- American Statistical Association
- Association for Computational Linguistics
- Association for Computing Machinery
- Association for Educational Data Systems
- Data Processing Management Association
- Institute of Electrical and Electronics Engineers Computer Society
- Instrument Society of America
- Society for Computer Simulation
- Society for Industrial and Applied Mathematics
- Society for Information Display.

"NCC is a scientific and educational conference that has evolved into the preeminent event of the industry," according to the Afips executive director. "It's the occasion when it's possible to bring together all aspects of information processing from leaders in the field to exhibitors," Raisig said.

Free Sunday Session to Survey DP Job Market

HOUSTON — A free session on the day before the National Computer Conference opens here next week will attempt to cover everything you always wanted to know about finding a job in the data processing industry.

"The Profitability of Career Planning," intended for people who have not yet carved a niche in the computer industry, is being presented Sunday, June 6, by the local NCC planning committee.

"This is not really for the professionals," Linda Vermillion, supervisor for office services for the Houston-based Hydrill Co. and local NCC planning committee chairwoman, explained. "This is for the students who are deciding about a career. The panel is made up of personnel people and industry professionals in the computer world to give their viewpoints and pointers on what to expect in that kind of a world."

Herbert B. Safford, staff administrator for GTE Data Services, Inc. in Marina Del Rey, Calif., will be chairing the two concurrent sessions. "Plotting Your Computer Career — Business Major" and "Plotting Your Computer Career — Engineering Major." They will be held in the Astrohall, in Rooms 307 and 311, off the lobby.

There will be four speakers at each seminar, according to Betty Lou Cook, marketing manager for the American Federation of Information Processing Societies, Inc., which is sponsoring NCC.

The sessions will cover subjects such as education curricula, career objectives, transition from student to employee, resumes, selecting the right company, interviews, accepting and rejecting salary offers, understanding the work environment and identifying the opportunities of career development.

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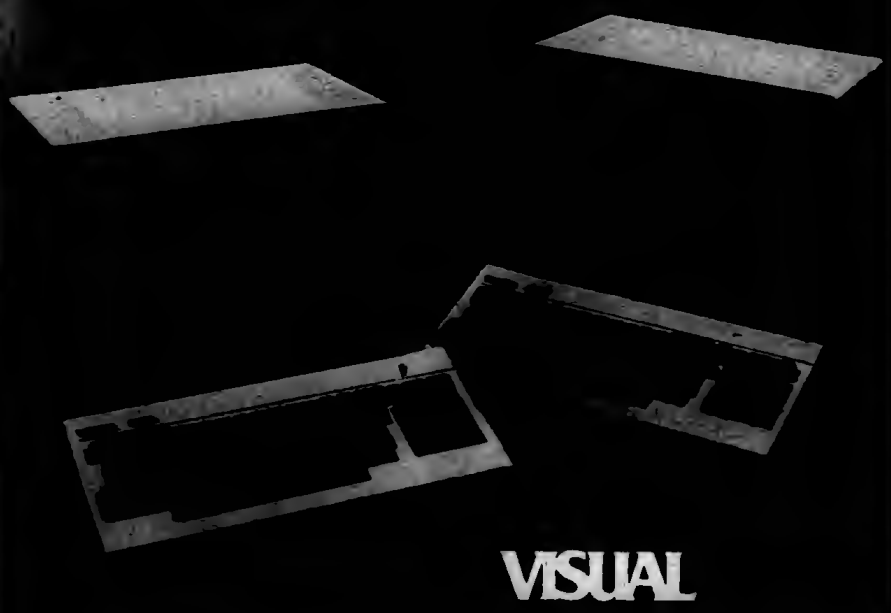


VISUAL

Early Birds Can Register On Sunday

HOUSTON — Early registrants at the National Computer Conference here not only will avoid the hassle of Monday morning's long lines, but also will get to eat, drink and be merry Texas style.

The local planning committee for this year's conference is throwing an Early Bird Reception from 4 p.m. to 6 p.m. in the Astrohall on Sunday, June 6.

Preregistered attendees and those who register on-site on Sunday can flash their badges and join the "Welcome to Texas" party which naturally will include Texas music, wine, beer and refreshments — all on the house.

Sunday registration for NCC will open at 2 p.m. Pick up your badge there, then look for the festivities off the registration lobby in the Astrohall.

And don't forget your ten-gallon hat.

Special Facilities Set for Visitors From Abroad

HOUSTON — To help visitors from other countries feel more comfortable at the National Computer Conference, an International Visitors Lounge will be set up in Room 120 of the Astrohall by the show sponsor, the American Federation for Information Processing Societies (Afips).

The lounge will provide a place for international visitors to gather and relax over a cup of coffee, an Afips spokesman said.

The room will also offer a number of other services put together by the Special Activities Steering Committee, headed by Linda Vermillion, supervisor of office services at Hydril Co. Among them are:

- An international currency exchange desk to provide foreign visitors with American currency.
- A computer-based "friend-finder" that will list foreign guests, enabling their countrymen to find them in their respective hotels.
- Professional and volunteer translators for Japanese, Chinese, Spanish, German and French.
- An activities person to help international visitors with local tours and restaurant arrangements.
- A message center.
- Complimentary refreshments.

The "friend-finder" minicomputer is being supplied by North Star Computers, Inc. For security reasons, its data base will not list room numbers but will list visitors by hotels, Vermillion said.

The telephone number at the Foreign Visitors Lounge is (713) 791-0009.

Further details on the "Help for Foreign Visitors" program are available from Linda Vermillion at (713) 449-2000.

NCC Will Be a Wonderland Of Terminals On, Off Floor

HOUSTON — A chicken in every pot and a terminal for every show attendee. Well, maybe not that many, but there will be a significant number of terminals both on and off the show floor at this year's National Computer Conference — glowing in a variety colors and offering a number of services.

The fresh-faced DP enthusiast just breezing into the conference will be hit with the first salvo of terminalitis in the form of the American Federation of Information Processing Societies, Inc.'s (Afips) registration system. Here, the attendee will be faced with 40 Lear Siegler, Inc. ADM-1 data entry terminals attached to a Data General Corp: Nova 1200 minicomputer, according to an Afips spokesman.

For many, these terminals will be chip-level looking glasses that allow passage into the Alice's Wonderland known as the NCC exhibit floor.

On the Floor

Once on the floor, attendees won't be abandoned by their terminal friends. At four strategic points within the Astrohall and Astroarena, a number of information "clusters" will provide a computer-based roadmap to the various vendors and their products.

The clusters include 18 Model TT-100 touch-sensitive terminals manufactured and provided by Interaction Systems, Inc. They will be programmed to offer such information as vendor whereabouts, a list of product areas and even a guide to local restaurants. A hard-copy facility, available for the first time at NCC this year, will allow you to take the information with you.

Users can activate the touch-sensitive system by stepping up to one of the terminals and placing a finger on the particular category they want to access.

Six Categories

There are six categories; exhibitors, products, NCC conference calendar, NCC conference topics, Houston restaurants and "Flash — Special Features."

The "Flash" category is a new offering for the system, which made its debut last year. Here, vendors can present mini-profiles of their products or messages to the show's attendees.

The entire touch-sensitive information system is designed and programmed by Interaction Systems. Last year, some 14,000 people used the then eight-terminal system that was positioned in two locations at the NCC's Chicago site. Even more attendees are expected to use the system this year, both because of the expanded number of terminals and the huge area taken up by the show, an Interaction Systems spokeswoman said.

Vendors will also be using terminals as their first line of offense to capture the minds and souls of those traveling the carpeted NCC floors. Nearly every booth will have at least one terminal offering a window into a computer, and a number will have flickering screens designed to tickle more than the user's corporate fancies.

DG, for example, will have four CRT terminals reserved for its "anxiety" sweepstakes. Users can use the terminals to enter their names and addresses in a random drawing that has as a prize a free trip to Aspen, Colo., and a year's supply of Guinness stout. What more can you ask from a terminal?

Theaters to Run Continuously

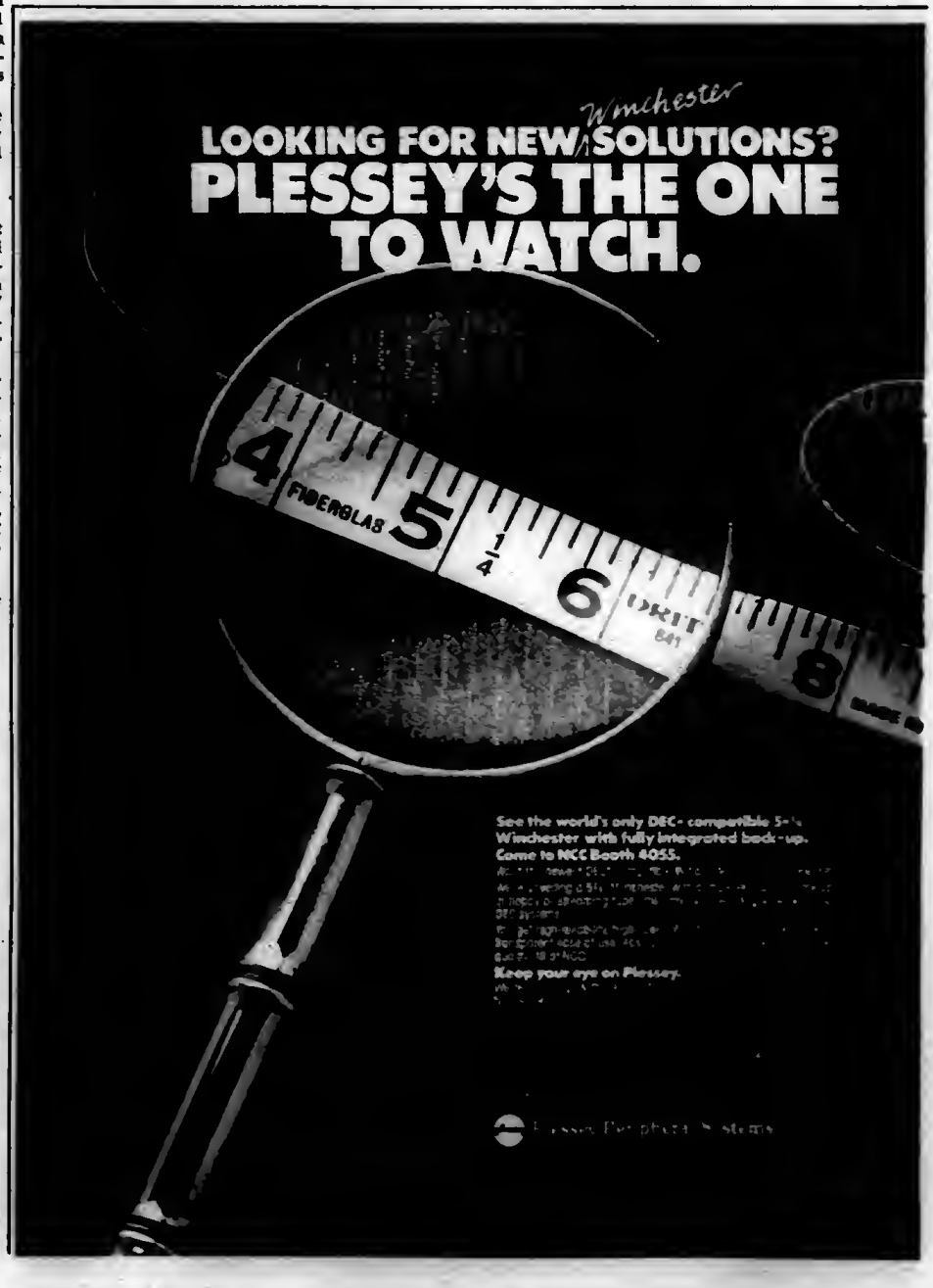
HOUSTON — Two theaters will continually screen movies and video tape productions throughout the National Computer Conference here.

Films will be shown on recent advances in business, DP management, programming, communications, aerospace, robotics, office automation and various other areas, according to the show's sponsor, the American Federation of Information Processing Societies, Inc. (Afips).

Two films Afips noted as being of special interest are the National Aeronautics and Space Administration's (Nasa) 1981 release titled "Space Research and Health" and Polaroid Corp.'s 1982 film called "Graphics Harmony." The Nasa film illustrates how computer technology for space exploration has led to the discovery of new medical tools. Polaroid's production was designed specifically for the computer community to provide information on color as a communications medium in computer graphics.

The motion pictures will be shown in Astrohall Rooms 201A and 201B. They are free to all conference attendees.

Further information can be obtained from NCC '82 Film Forum Chairman Eddie Truncellito at Schaumberg Well Service, Inc. here in Houston.



NCC '82 Schedule at a Glance

	MONDAY 10:00–11:00 am	MONDAY 1:45–3:15 pm	MONDAY 3:30–5:30 pm	TUESDAY 8:30–10:00 am	TUESDAY 10:15–11:45 am	TUESDAY 12:15–1:15 pm	TUESDAY 1:45–3:15 pm	TUESDAY 3:30–5:30 pm
HARDWARE/COMPUTER ARCHITECTURE Dennis Fralley	KEYNOTE SPEAKER James Olsen AT&T Ballrooms A-D	M1-1 Microprogramming and Firmware Engineering S. Davidson, Western Electric Company A	M2-1 Commercial Fault-Tolerant Computer Architectures J. Meyer, University of Michigan A	T1-1 Innovation in Commercial Architectures: What Have We Learned and Where Are We Going? D. Fralley, Texas Instruments Incorporated A		PLENARY SPEAKER Theodore Burtis Sun Company Ballrooms A-D	T3-1 Data File Compatibility for 5.25 Inch Disk Cartridge Drives D. Minami, UMA Systems A	T4-1 ANSI-1228-OEM Storage Interface of the 80's R. Layer, 3M A
SOFTWARE ENGINEERING Randall Jensen		M1-2 Parallel Programming and Parallel Computing for Large Systems J. Brown, University of Texas at Austin C	M2-2 Designing Systems for Performance K. Chandy, University of Texas at Austin 307	T1-2 Effective Software Documentation R. MacAuslan, Honeywell C	T2-2 Software Engineering Education D. Rine, Western Illinois University C		T3-2 Breadboarding: Prototyping of Software Systems J. Urban, University of Southwestern Louisiana C	T4-2 Software Development Environments M. Deutsch, Hughes Aircraft Company C
PERSONAL COMPUTING Robert Frankston		M1-3 Software Environments/Operating Systems A. Irvine, Softech Microsystems Incorporated 311		T1-3 Local Area Nets H. Dreifus, University of Pennsylvania 311	T2-3 Large Volume Software Issues J. Brackett, Softech Microsystems 307		T3-3 Personal Computer Industry: The Experts Forecast The Future P. Isaacson, Future Computing, Incorporated 311	T4-3 Personal Computer Industry Forum P. Isaacson, Future Computing, Incorporated 311
SOCIAL AND ORGANIZATIONAL IMPLICATIONS Beverly Kahn		M1-4 Encryption, Science and Secrecy D. Brandin, SRI International P. Denning, Purdue University D	M2-4 Privacy and Security J. Nye, Marketing Consultants International, Incorporated C	T1-4 Improving Job Satisfaction of the Computer Professional A. Hoffman D	T2-4 New Laws in Computing S. Nycum, Gaston Snow and Ely Bartlett B			T4-4 Distributed Processing Approaches R. Billings, Billings Computer Corporation B
OFFICE SYSTEMS Amy Wohl			M2-5 Combining Image and Data Processing Within the Office D. Zatykn, Zatyko Associates 300	T1-5 Management and Professional Workstations E. Wilk, Arthur Andersen and Company 300	T2-5 Strategic Planning for Office Automation H. Morgan, University of Pennsylvania 300		T3-5 Overview Session: The State of Office Automation A. Wohl, Advanced Office Concepts 300	T4-5 Office Automation and Knowledge Worker Productivity M. Kahn, Honeywell Information Systems, Inc. 300
MANAGEMENT ISSUES/DECISION SUPPORT SYSTEMS Jim Emery, Gene Altshuler		M1-6 Decision Support Systems in Medicine J. Augenstein, University of Miami/Jackson Memorial Hospital Medical Center S	M2-6 Programmer Productivity L. Weber, Peat, Marwick, Mitchell & Co. B	T1-6 Artificial Intelligence and Decision Support Systems A. Robinson, SRI International 307	T2-6 Decision Support Systems in Government P. Keen, Massachusetts Institute of Technology A		T3-6 Tutorial for Decision Support Systems A. Napier, University of Houston 307	
LANGUAGE AND DATABASE PROCESSING Peter Buneman		M1-7 Research Towards Database Standards J. Swager, Honeywell Information Systems, Incorporated 307	M2-7 Machine Intelligence: from the Laboratory to the Cold World A. Borgida, Rutgers University 311	T1-7 Topics in Database Systems G. Thomas, Kent State University B	T2-7 Database Management Systems for Microcomputers F. Maryanski, Digital Equipment Corporation D		T3-7 Database Integration D. McLeod, A. Motro, University of Southern California S	T4-7 Evaluating Database Management Systems B. Yao, University of Maryland D
APPLICATIONS OF COMPUTING Allen Smith			M2-8 Directions in Library Applications D. Penniman, OCLC Incorporated D		T2-8 Computer Graphics Applications S. Gnanamgari, Siemens Corporation 311			T4-8 Network Management Issues R. Sibatani, Sytek, Incorporated 307
PIONEER DAY Walt Brainerd								

PROFESSIONAL DEVELOPMENT SEMINARS (Optional at extra cost) Presented at Shamrock Hilton

COMPUTER GRAPHICS		Computer Graphics for Management Information Systems: An Overview (TA) F Irwin M. Jarett, J.M. Jarett, CPA, LTD
COMMUNICATIONS/DATA SECURITY		Regulatory and Legislative Developments & Their Implications for Telecommunications and Data Processing (TB) F Mary Jo Manning, Hedrick & Lane Walter Hinchman, Hinchman & Associates
DATA MANAGEMENT	Data Base Management in the 80's (MC)F James A. Larson, Honeywell Corporate Technology Center	Structured Design (TC) F Ned Chapin, InfoSci, Inc.
CURRENT ISSUES IN NEW TECHNOLOGY	Creating Receptivity to Technology (MD)H Gloria J. Gery, Gery Associates	Low Cost Word Processing (TD) H Laurence Press, Small Systems Group
GENERAL	The Computer Professional as Expert Witness (ME)H John M. Conley, James J. Marcellino, Gaston Snow & Ely Bartlett	

F = Full day—9:00 am to 4:30 pm H = Half day—1:30 pm to 4:30 pm

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WEDNESDAY

	8:30–10:00 am	10:15–11:45 am	12:15–1:15 pm	1:45–3:15 pm	3:30–5:30 pm
HARDWARE/COMPUTER ARCHITECTURE Dennis Frailey	**W1-1** Microprocessor Systems in CMOS K. Kristie, Motorola, Incorporated *A*	**W2-1** Distributed 16-Bit Processing B. Patterson, Intel Corporation *A*	**PLENARY SPEAKER** Gordon Marison U.S. Postal Service Ballrooms A-D	**W3-1** Single-Chip Microcomputer Advances C. Melear, Motorola Incorporated *A*	**W4-1** Single-Chip Microcomputer Programming J. Millar, Texas Instruments Incorporated *A*
SOFTWARE ENGINEERING Randall Jensen	**W1-2** Software Engineering in the 1990's J. Rader, Hughes Aircraft Company *C*	**W2-2** Application Generators: Current Use and Future Prospects J. Grochow, American Management Systems, Incorporated *307*			
PERSONAL COMPUTING Robert Frankston	**W1-3** The Home and Games Business T. Tiedtke, Atari Incorporated *311*	**W2-3** User Interface for Personal Workstations (Part One) P. Heckel, Interactive Systems Consultants *311*		**W3-3** User Interfaces for Personal Workstations (Part Two) L. Tesler, Apple Computers *311*	**W4-3** Small Computers in Large Organizations J. Nesbit, Nesbit Consulting *311*
SOCIAL AND ORGANIZATIONAL IMPLICATIONS Beverly Kahn	**W1-4** Impact of ADA on Software Engineering G. Booch, United States Air Force Academy *307*				
OFFICE SYSTEMS Amy Wohl		**W2-4** Local Area Networks: How Broad Is Broad Enough? D. Kutnick, Yankee Group *300*		**W3-4** Natural Language Help Systems R. Fenchel, Xerox Corporation *300*	**W4-5** Augmented Text Editing Functions P. Seybold, The Seybold Group, Report on Office Systems *300*
MANAGEMENT ISSUES/DECISION SUPPORT SYSTEMS Jim Emery, Gene Altshuler		**W2-5** Organizational and Behavioral Impact of Information Technology C. Singer, Index Systems, Incorporated *B*		**W3-5** Linking Information Systems With the Business Strategy T. Johnson, Nolan, Norton & Co *B*	**W4-6** Concepts and Practice of Measurment in an MIS R. Mason, University of Southern California *B*
LANGUAGE AND DATABASE PROCESSING Peter Bumman	**W1-7** Intelligent User Assistance for Computer-Based Environments T. Kehler, Texas Instruments Incorporated *D*	**W2-7** What Is Different About Teaching ADA? V. Mall, ADA Joint Program Office *D*		**W3-7** When Will We Be Able to Use ADA? S. Lomonaco, Institute of Defense Analyses *D*	**W4-7** Computerized Dictionaries: Processing Machine Readable Text M. Evens, Illinois Institute of Technology *D*
APPLICATIONS OF COMPUTING Allen Smith	**W1-8** Computing Applications R. Gammill, North Dakota University *300*				**W4-8** Interconnecting Our Automated Offices J. McQuillan, BBN *C*
PIONEER DAY Walt Brainerd		**W2-8** The Stored Program Concept N. Stern, Hofstra University *C*		**W3-9** The Early Days of Fortran J. Backus, IBM Corporation *307*	**W4-9** The Institutionalization of Fortran *307* J. Adams, Chair X3J3 (ANSI)

THURSDAY

	8:30–10:00 am	10:15–11:45 am	12:15–1:15 pm	1:45–3:15 pm
HARDWARE/COMPUTER ARCHITECTURE Dennis Frailey	**H1-1** Parallel and Distributed Systems C. Davis, Ballistic Defense Advanced Technology *A*	**H2-1** Powerful Parallel Systems for Real-Time Applications S. Kartashev, DCA Incorporated *A*	**PLENARY SPEAKER** Ruth Davis Pymatuning Group Inc. Ballrooms A-D	
SOFTWARE ENGINEERING Randall Jensen	**H1-2** Software Engineering Requirements Definition and Analysis J. Winchester, Hughes Aircraft Company *C*	**H2-2** Software Quality Assurance Environments and Approaches M. Holthouse, The Analytic Sciences Corporation *C*		**H3-2** Software Life-Cycle B. Boehm, Productivity, TRW Systems, Incorporated *A*
PERSONAL COMPUTING Robert Frankston				
SOCIAL AND ORGANIZATIONAL IMPLICATIONS Beverly Kahn	**H1-4** Resiliency of the Information Society... R. Turn, California State University *307*	**H2-4** Vulnerability of the Computer Society L. Hoffman, The George Washington University *307*		**H3-4** Small Computer Applications in Criminal Justice S. Kadetsky, Search Group Incorporated *307*
OFFICE SYSTEMS Amy Wohl	**H1-5** Advanced Technologies for the Office C. Mueller-Schloer, Siemens Corp *300*	**H2-5** Electronic Mail W. Ulrich, Walter E. Ulrich Consulting *300*		**H3-5** User Interface, I D. Vaskevitch, Standard Software Limited *311*
MANAGEMENT ISSUES/DECISION SUPPORT SYSTEMS Jim Emery, Gene Altshuler	**H1-6** Complex Business Systems: A Strategy for Success N. Bloom, American Management Systems Inc *B*	**H2-6** Software Maintenance N. Chapin, InfoSci, Incorporated *B*		**H3-6** Computer Assisted Decision Rooms P. Grey, Southern Methodist University *B*
LANGUAGE AND DATABASE PROCESSING Peter Bumman	**H1-7** Real-Time Applications of Forth E. Rather, Forth, Incorporated *D*	**H2-7** Pascal – Easing the Maintenance Burden A. Brown, Datapoint Corporation *D*		**H3-7** Distributed Computing R. Filman, Hewlett Packard *D*
APPLICATIONS OF COMPUTING Allen Smith	**H1-8** CAD/CAM Applications and Development A. Smith, Atlantic Richfield Company *311*			
PIONEER DAY Walt Brainerd				

PROFESSIONAL DEVELOPMENT SEMINARS (Optional at extra cost) Presented at Shamrock Hilton

COMPUTER GRAPHICS	Implementing Successful Business Graphics Systems **(WA) F** Allan T. Paller, AUI Data Graphics	Computer Graphics Design for Effective Communications **(RA) F** George F. McCleary, Jr., Univ. of Kansas
COMMUNICATIONS/DATA SECURITY	Overview and Directions in Local Computer Networks **(WB) F** Harvey A. Freeman, Architecture Technology Corp	Control and Security Issues in System Development **(RB) F** Alan E. Brill, YOURDON, Inc
DATA MANAGEMENT	Data Analysis Techniques **(WC) F** Richard C. Perkinson, Q.E.D. Information Sciences, Inc	
CURRENT ISSUES IN NEW TECHNOLOGY	Managing, Controlling & Auditing Minicomputer Systems **(WD) F** Edward H. Murray, Management Advisory Services	Human Issues in Designing & Implementing Office Automation Systems **(RD) F** Lawrence K. Williams, Consultant
GENERAL	Motivating Data Processing Personnel **(WE) H** J. Daniel Couger, Univ. of Colorado	Breakthroughs in Strategic Planning and EDP Project Management **(RE) F** Alan P. Martin, Proactive Management Group, Inc.

F = Full day—9:00 am to 4:30 pm H = Half day—1:30 pm to 4:30 pm

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Afips Says Registration to Take 20 Minutes at Most

HOUSTON — "It will take 10 or 15 minutes to register for the National Computer Conference — 20 minutes, at the most," promised Janis Miller, director of finance and administration for the sponsor of NCC, the American Federation of Information Processing Societies, Inc. (Afips).

The number of people attending NCC here this year is expected to be greater than the combined populations of Monaco, Liechtenstein, Vatican City and the Falkland Islands. Between 80,000 and 100,000 people are expected to attend, and more than 10,000 of them will register Monday between 7:30 a.m. and 6 p.m. If you are not preregistered, you will have to wait in line for only 20 minutes.

"We've got a lot of registration volunteers this year," Miller said. "What will happen is that people can straighten out any problems with the volunteers before they get in line for registration."

The main registration area is at the North Hall entrance of the Astrohall, where you will find 22 volunteers, 19 cashiers and 40 badge typists, Miller said. But to get through these lines will take 20 minutes — at the most.

While there will be no colored carpets to direct attendees, as there were last year in Chicago, there will be three different types of registrants. If you have in no way registered for the conference, you are at square one and must fill out a registration form, pay the cashier and pick up a badge. If you managed to get your registration form in to Afips but were too late to receive your badge by return mail, then you must go to the "advance desk" and get your badge. If you are among the lucky breed known as "Exhibitor's Guest," all you need is a badge, according to Miller.

But remember, no matter which type you are, the most time you will spend in line is 20 minutes.

Each type of registration procedure will take place in clearly marked lines, Miller said, and there will be a cashier at the Shamrock Hilton Hotel where the Professional Development Seminars will be held. So it will be possible for attendees to go directly to the hotel to register before attending their seminars.

Maximum waiting time there: 20 minutes.

Registration will take place each day starting at 7:30 a.m. and attendees can choose between a $25 daily fee or a $90 full-conference fee.

All registration is automated by Registration Control Systems, Inc. with an on-site Data General Corp. Nova 1200 minicomputer, five Pertec Computer Corp. tape drives, 40 Lear Siegler, Inc. ADM-1 data entry terminals and 20 Addressograph-Multigraph Corp. 6800 embossing machines. The Long Beach, Calif., company will bring in this equipment to ensure that the maximum waiting time for those wanting to register is 20 minutes, tops.

Is there any way that registration will take longer than 20 minutes? According to Miller, "If it rains or if it's a really hot day, that could slow things down."

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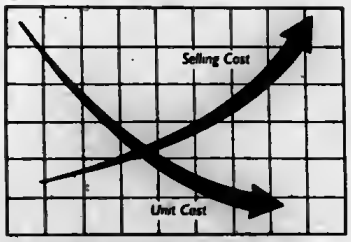

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Early Sign-Up For Handicapped Set for Sunday

HOUSTON — People with handicaps can register for the National Computer Conference during its Early Bird Registration time, on Sunday, June 6, from 2 p.m. to 6 p.m. in the Astrohall's registration lobby. They are also encouraged to join the show's sponsor, the Association of Federal Information Processing Societies (Afips), in nearby Room 301 at the Astrohall for an Early Bird Reception consisting of country music, beer and wine, compliments of Afips.

Special arrangements at the show for people with handicaps include a lounge in Room 513 of the Astrohall, next to the main registration lobby, where they can "get away from it all," according to an Afips spokesman. The lounge's telephone number is 791-0012, and complimentary refreshments will be on hand.

Show management has toured the unilevel Astro complex, making sure that ramps are in place wherever needed. Afips has established a transportation hotline, however, to accommodate any special transportation needs that may arise. That number is 791-0000.

Further information on special facilities can be obtained from Kerry Baer of IBM, who is heading the "Help for the Handicapped" volunteer conference program. She can be reached at (713) 940-2328.

Early Leaders to Speak

Pioneer Day to Honor Fortran

HOUSTON — Elvis, Sputnik and "I Love Lucy" were in the national consciousness on April 15, 1957, but something else with far-ranging reverberations crept quietly in the back door that week, hid in a corner and waited decades for its full influence to be felt.

Twenty-five years after the introduction of the first Fortran Formula Translation compiler, Pioneer Day at the National Computer Conference — Wednesday, June 9 — will honor the first language of computers and the pioneers who helped usher in the Age of Information.

The history of Fortran — the first commercially successful and longest sustained scientific language system in the industry — will be presented in two afternoon sessions in the Astrohall. "The Early Days of Fortran" and "The Institutionalization of Fortran" will feature members of the original development team, administrators, early users and others who pioneered the use of Fortran.

John Backus, head of the IBM team that developed the first Fortran compiler, will lead "The Early Days of Fortran," a session that will feature presentations by such pioneers as Robert Bemer, speaking on "Computing Prior to Fortran"; Richard Goldberg, on "Register Allocation in Fortran I"; and Roy Nutt, on "Compiler Techniques Available in 1954."

Other presentations in that session will include Fran Allen speaking on "A Technical Review of the Early Fortran Compilers" and John McPherson on "Early Computers and Computing Institutions." The session runs from 1:45 to 3:15.

"The Institutionalization of Fortran," running from 3:30 to 5:30, will be led by Jeanne Adams, the current chairwoman of the Fortran Standards Committee. In that session, Pioneer Herbert Bright will tell of "An Early Fortran User's Experience"; Robert Hughes will discuss "Early Fortran at Livermore"; and William Heisling will recount "The Emergence of Fortran IV From Fortran II."

The "History of Fortran Standards" will be presented by Martin Greenfield; Daniel McCracken will discuss "The Early History of Fortran Publications"; and Charles Davidson will describe "The Emergence of Load-and-Go Systems."

James Sokoda will address "Dystal — A Nonnumeric Application" and Bruce Rosenblatt will address the topic "The Successors to Fortran; Why Does Fortran Survive?"

Besides sessions, there will be a special exhibit of Fortran memorabilia, including a collection of textbooks printed since 1957 and the foreign language editions of vendors' manuals, in the Astrohall. Located off the main registration area, the exhibit will be accessible to attendees even before they register.

Also, IBM Communications is producing a 20-minute film of commentary on Fortran to be shown continuously in the exhibit area and daily in the Computer Science Theatre.

Lively Session Promised

HOUSTON — Looking for the liveliest session at the National Computer Conference? You can be sure controversy will reign at the morning gathering of Pioneer Day, dedicated to the origin of the stored program concept.

Nearly 40 years after the Hungarian mathematician John Von Neumann published the "First Draft of a Report on Edvac" — the Electronic Discrete Variable Automatic Computer — in 1945, in which he described the stored-program principle, controversy still surrounds its origin.

"The Stored Program Concept" will start at 10:15 a.m. on Wednesday, June 9. Chaired by Nancy Stern, chairman of the Department of Administrative Computer Systems at Hofstra University, the panel discussion will present the diverse views of Pioneers J. Presper Eckert Jr., Maurice Wilkes, Herman Goldstine and Richard Clippinger.

Xerox interactive software for Digital hardware.

Xerox Computer Services is now marketing Praxa Software—proven applications software for manufacturers and distributors specifically designed to run on in-house Digital PDP-11 and VAX hardware.

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But software is only as good as the people who stand behind it. And at Xerox, we have over eleven years experience installing and supporting interactive systems. Our branch offices are in major cities nationwide. And in Europe, too. So we're there when you need us.

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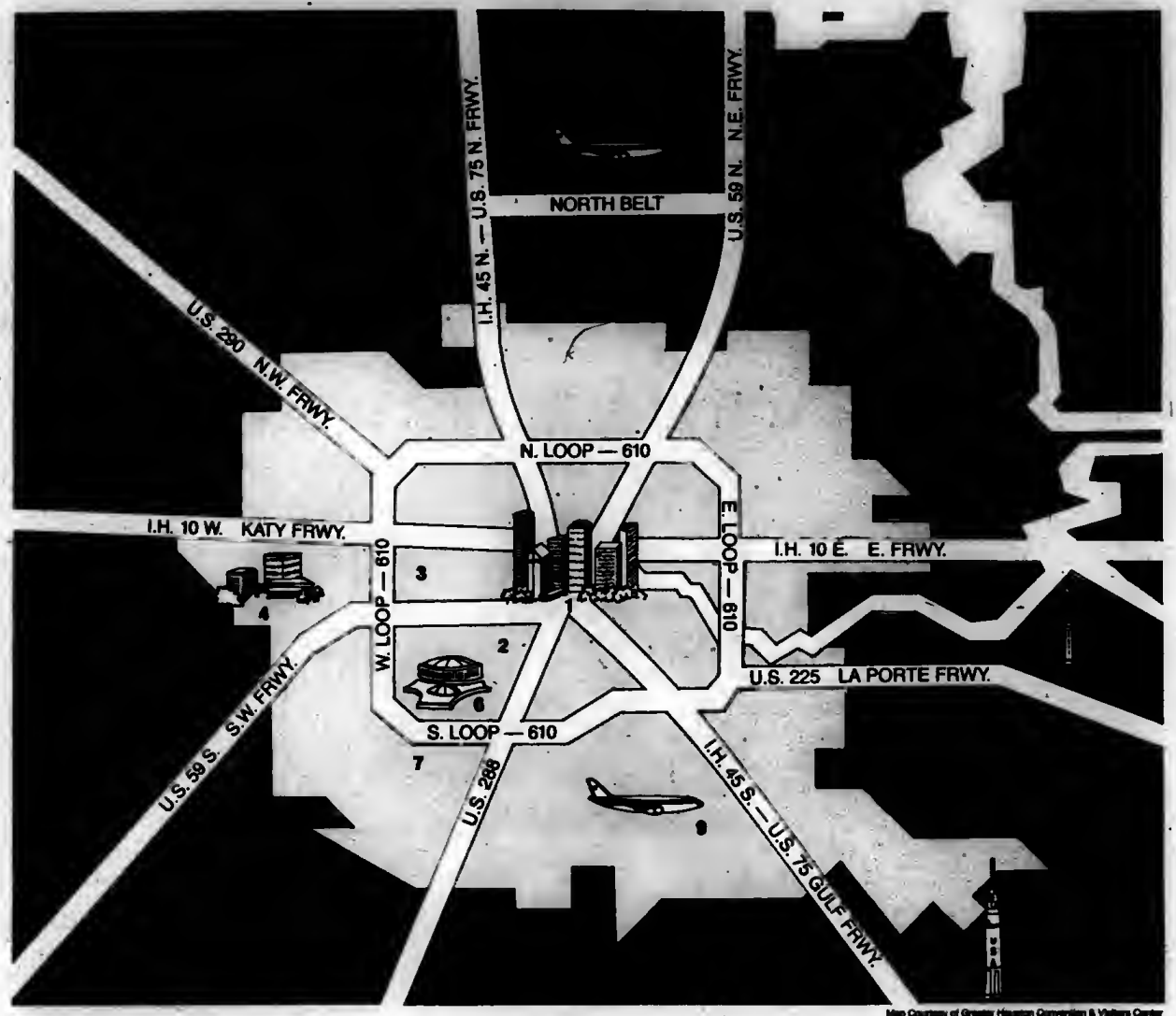
XEROX CWS/31/82

When You Get to Houston, Here's How to See It



Map Courtesy of Greater Houston Convention & Visitors Center

1. Central Business District
2. Medical Center Area
3. Greenway Plaza Area
4. Galleria Area
5. Nasa
6. Astrodomain
7. Astroworld Theme Park
8. Houston Intercontinental Airport
9. William P. Hobby Airport
10. San Jacinto Battleground And Battleship 'Texas'

By Henry A. de La Garza
Special to CW‡

If you're chomping at the bit to see Houston, there's a number of choices available to you. Here are just some of the alternatives at your fingertips.

Abram's Ambassadors Tours, Inc. (658-9212) maintains a 24-hour office providing daily aerial, ground and sea tours of Houston, the Lyndon B. Johnson Space Center and Galveston Island. The Carriage Company, Inc. (850-1102) also provides aerial tours as well as convention and group tours.

For general sightseeing, there is Limousines of Houston, Inc. (861-4211); Royal Limousines, Inc. (928-5544); and Grayline Tours of Houston (757-1252).

A number of companies specialize in group tours, including Astro Limousine Service (862-6777); Mike Jarman and Associates (455-0071); Lone Star Travelers, Inc. (880-1513); and Yellow Cab (224-4445). Astro City Tours (861-0136) uses charter busses and passenger vans to provide tours (by reservation only) for the Space Center and Houston.

Two local companies — Meet Houston, Inc. (666-7395) and Limousines Service International (524-8468) — provide convention and visitor tours. Angel's Travel & Tours (776-8551) offers Japanese and Chinese tours and interpreters, while the Japan Culture Center (333-4419) is in the business of providing tours and interpreters.

Perhaps the ultimate in tours — if you somehow feel that Houston is not enough — is Adventures in Texas (668-6807), which will take you on tours throughout the state.

There are some recreational tours that might catch your fancy. Bay Charters, Inc. (440-7016) boasts the "Lady Barbara," a 40-footer complete with air conditioning, television, stereo and other features — all for charter by reservation. Pier 5 Paddlewheel, Inc. & Seafood Restaurant (334-3311) features paddleboat tours available for private charter. And finally, Reel Fun Charters, Inc. (771-4725 or 480-2185) runs a party boat out of Galveston for individuals and company or private parties.

Then there are tours operated by various Houston establishments. Astrodome Tours (749-9544) will take you on a long walk through the Astrodome, complete with behind-the-scene areas. Or see the Port of Houston aboard the "Sam Houston," which takes an hour-and-a-half voyage down the Ship Channel from the Turning Basin — a round trip of 15 miles. The Ship Channel tour is operated by the Port of Houston Authority (225-0671).

De La Garza, who served as press secretary to former Houston Mayor Jim McConn, researched and wrote the information on Houston contained in this special Computerworld *"NCC Preview." Currently a self-employed public relations counselor and a member of the Public Relations Society of America, he has been a television news producer and corporate public relations manager.*

Houston's Museums Offer History and Amusement

By Henry A. de La Garza
Special to CW‡

Picture yourself next week at the National Computer Conference. You're sitting in on one of the many technical sessions. It's been a tense morning, and a stalemate looms. The select panel of computer scientists is locked in heated debate over the oft-asked question, "Is there life after superminis?"

Emotions among NCC delegates are about to peak when a plaintive voice from the audience asks, "Maybe the answer can be found at the Lyndon B. Johnson Space Center?"

"How about the Burke Baker Planetarium in the Museum of Natural Science?" suggests another.

"Or the Museum of Fine Arts!" cries a third.

Whether the subject is superminis or space travel, emulators or Egyptian tombs, software compatibility or artist Alexander Calder, the answers to many questions can be found in Houston's museums. Even if you have no questions, you can ride a space shuttle to distant terrestial bodies, stand on the deck of the battleship U.S.S. Texas, make friends with a 70-ft. Diplodocus or learn how a volcano like Mt. St. Helens blows its top.

NASA LYNDON B. JOHNSON SPACE CENTER

Ever wondered just exactly to whom Neil Armstrong was speaking on that momentous day in July 1969, when he landed on the moon and announced, "Houston, Tranquility Base here. The Eagle has landed"? Ever wondered just exactly where all the astronauts are selected and trained, or just exactly where America's manned space flights are controlled, or just exactly where experiments are conducted during space flights and where space technology is developed?

Ever wondered what a real moon rock or the *Apollo 17* spacecraft or the mammoth Saturn rocket or the Lunar Exploration Module or the Moon Rover or astronaut Gordon Cooper's Mercury space capsule look like close up and near enough to touch?

Well, folks, wonder no more. The answers to these questions and many others can be found a mere 25 miles from downtown Houston ("Space City" to the locals) and free of charge.

The Space Center is located out I-45. Take the superslab south from downtown Houston, get off on the Nasa Road One exit, hang a louie or go east till you get to 2102 Nasa Road One. Enter the space center, which sits on the north side of the road, park your car and get ready for a real thrill. The three life-size rockets on display at the edge of the parking lot are just for starters — "you ain't seen nothing yet, folks!"

MUSEUM OF FINE ARTS

Located on a three-acre tract of land near Hermann Park, the Museum of Fine Arts features a fascinating permanent collection that spans from esoteric Egyptian tomb articles to Greek and Roman contemporary hilarity; Italian, French, Dutch, Flemish and British schools; impressionists and Post-Impressionists; photographers; contemporary artists; and the Renaissance.

But your attention will be captured even before you enter the building, which offers neoclassical beginnings with Mies van der Rohe additions. On the lawn in front of the museum is a sculpture garden adorned by Alexander Calder's *The Crab, The Walking Man* by Rodin and *Albesti Gorgora V* (the stone puzzle) by Eduardo Chillida as well as other works, all of which are identified just inside the museum near the doors.

The museum's permanent collection is augmented by special exhibits. Currently, four such exhibits are on display during NCC:

• "Miro in America" in the upper Brown Gallery capsulizes Joan Miro's im-

(Continued on Preview/14)

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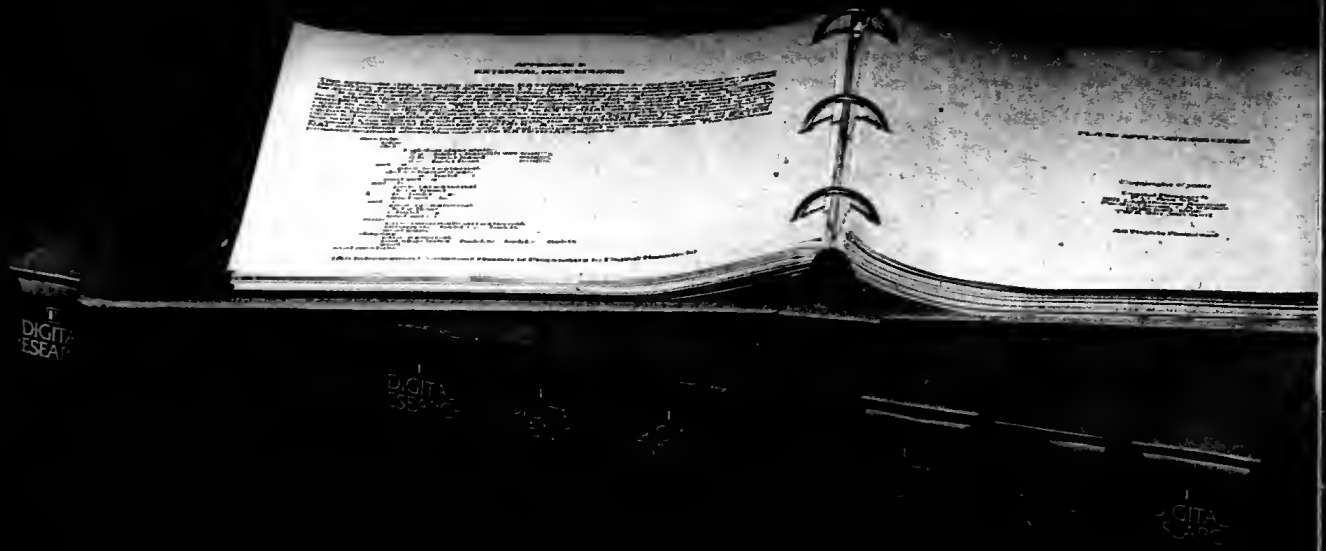

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Houston's Museums Offer Historic Diversions

(Continued from Preview/11)

pact on American art. Miro's art — including more than 100 paintings spanning the artist's career, as well as works on paper, sculpture and ceramics — is displayed along with works by American artists he influenced: Mark Rothko, Arshile Gorky, Jackson Pollock and Alexander Calder, among others.

• "J.M.W. Turner Watercolors" from the British Museum, displayed in the Weiss Gallery, contains art works spanning from his early, precise topographical drawings, through his later, more loosely rendered expressionistic scenes. Numbering 88, the works on exhibit were chosen from the more than 19,000 drawings and watercolors which Turner willed to Great Britain.

• The other two special exhibits are "Photographs by Doris Ulmann," a collection of 13 original platinum prints mostly of rural people during the 1920s and 1930s, and "Annual Student Exhibits," which reflects the best works from all disciplines taught by the faculty of the Alfred C. Glassell Jr. School of Art.

The Museum of Fine Arts is located at 1001 Bissonnet and is open Tuesday through Saturday from 10 a.m. to 5 p.m. Call 526-1361 for more information.

MUSEUM OF NATURAL SCIENCE, BURKE BAKER PLANETARIUM,

Find Houston's famed Hermann Park and you'll find the Museum of Natural Science complex, situated on four acres of land surrounded by moss-draped trees and both native and exotic shrubbery. The museum complex seemed to spring up overnight in 1964, but it was conceived more than a half-century earlier in 1909 when some environmentalists joined forces as the Houston Museum and Scientific Society.

Once inside, the visitor can study the collection of porcelain Boehn Birds, make acquaintance with Diplodocus, the towering 70-ft-long skeleton of a mild-mannered herbivorous dinosaur, and gaze forever at the collection of Indian artifacts from Alaska to South America.

There's even an exhibit featuring models, electronic boards and hands-on displays that tell the story of oil. This petroleum science and technology exhibit, one of the nation's foremost displays on the subject, explains oil's formation, how it is recovered and the many products made possible by the black gold. Where else but in Houston?

After you get past the earthy business, you'll want to take in the Burke Baker Planetarium, which re-creates the skies and heavens above in undiminished glory and pizzazz. During NCC the planetarium is offering "To Worlds Unknown," a program that takes you from good ol' Mother Earth aboard the space shuttle to all the planets and to the major moons in our solar system. As Boy Wonder would gush, "Holy space boosters, Batman!"

The Museum of Natural Science complex at 1 Hermann Circle Drive is open free to the public from 9 a.m. to 5 p.m. Tuesday through Saturday. It can be reached by telephone at 526-4273.

CONTEMPORARY ARTS MUSEUM

Within this modernistic steel structure one discovers a wide variety of changing exhibits of paintings, sculptures, photographs, posters and other media.

Sebastian Voron Photo (Courtesy Museum of Fine Arts, Houston)

Mies van der Rohe designed the Brown Pavilion (left), opened in 1974, and Cullinan Hall (right), opened in 1958 at Houston's Museum of Fine Arts.

The Contemporary Arts Museum is currently offering several exhibits of special note. Thirty-five recent black-and-white photographs by a respected Houston artist have been gathered into an exhibit entitled "Gay Block: Portraits." Known nationally for her works, Block's extensive body of work began in 1975 with "Portraits of Jews in America," which consisted of portraits of members of the artist's lifetime temple, Congregation Beth Israel in Houston.

Another special exhibit, "Robert Gordy Paintings and Drawings: 1960-1980," is a comprehensive retrospective of the work of an artist who has resided in New Orleans the last 18 years. Gordy developed his unique style after rejecting both the looseness and uncontrolled nature of ab-

(Continued on Preview/16)

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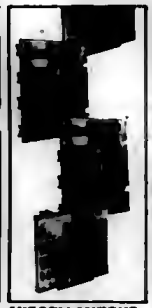
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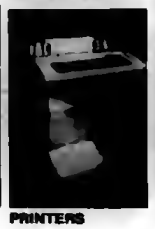
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BA11-PE	6 SYSTEM EXPANDER BOX W H7420-A PS, NO CONE NEG, 120Vac	4150	50%	2075
BA11-VA	H9281-BA, H7833-A, 120Vac (13.4"W, 3.6"H, 11.7"D)	700	50%	350
H334-E	H334-K W H7672-A POWEN SUPPLY, 120Vac	1350	50%	675
CABINETS				
H9610-AC	11V03-L CAB 30" W/O POWEN CNL	1350	50%	675
H9612-AC	11T03-L CAB 40" W/O POWEN CNL	1690	50%	845
H9613-AC	40" CAB W/SOLID TOP W/O PC	1890	50%	845
MISCELLANEOUS				
FP11-EA	FLOATING POINT (23 + 8 DN 55 + 9) PROCESSOR, H7421-C, 120Vac	6400	70%	1920
KE11-E	EXPANDED INSTRUCTION SET (MULTIPLY, DIVIDE, SHIFTS), FOR 11/35, 11/40	1900	53%	900
KE11-F	FLOATING POINT INSTRUCTION SET FOR 11/35, 11/40	1900	53%	900
KT11-D	MEMORY MANAGEMENT FOR 11/35, 11/40	3350	55%	1500
KY11-LB	PROGNAMMERS CONSOLE	950	30%	665
REV11-A	EXT NEFNESH + BOOT + TENM	360	53%	170
NEV11-C	EXTENNAL REFRESH + BOOT 1	360	53%	170
VK8-AB	[redacted]	[redacted]	[redacted]	315
COMMUNICATIONS				
DPM23-A	KDF11-AA, MSV11-DD, ISV11-B, BA11-NC, QJ642-AZ RSK-11S, QJ656-AZ, 120Vac	11500	30%	8050
DPM50-FA	INTELLIGENT I/O SUBSYSTEM KDF11-AA, H333-A TEV11, MSV11-DD, ISV11-A, QJ642-DZ RSX11-S, QJ655-DZ, QJ656-DZ, 120Vac	11450	30%	8015
DRV11-00	PARALLEL INTENFACE UNIT	300	15%	255
H326W	H326 EXCEPT NO COVEN OR STRAIN RELEASE	275	50%	135
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VT52-AC	[redacted] 100/120 Vac, 50/60 Hz	[redacted]	[redacted]	[redacted] 500
VT62-AC	WITH EIA W CORT 120 Vac	3358	85%	500
VT100-NB	VT100-AB W VT1XX-PN DECFORM KEYCAPS, 240 Vac	1945	23%	1500
VT110-AB	DPM01-MS + VT100-AB, 240Vac USA LINE CORD (50Hz)	6325	50%	3160
VT55-FB	VT52-BB W GRAPHRNG CAPABILITIES, 220/240Vac 50/60 Hz	5830	70%	1745
MEMORIES				
MF11-UP	32KB CORE IN DOUBLE SYSTEM UNIT, ROOM FOR ADDITIONAL 32KB UNIBUS INTERFACE	9600	84%	1500
MF11-WP	64KB CORE IN DOUBLE SYSTEM UNIT, NOOM FOR ADDITIONAL 64KB, UNIBUS INTERFACE	10100	75%	2500
MK11-BE	128 KBYTE MOS MEM EXPANSION (2 MS11-KE)	17200	78%	4995
MM11-DP	16K 18 BIT 18 MIL PARITY MEM, ONE 1" BOARD	5750	70%	1725
MM11-UP	32KB CORE, ADD-IN FOR WF11-UP	8600	86%	1200
MM11-WP	64KB CORE, ADD-IN FON MF11-WP	8500	76%	2000
MM8-AA	8K X 12 MEMORY, G649 + H219-A, 1.5 μSEC	2875	74%	750
MM8-AG	16K X 12 MEMORY, G649 + H219-B, 1.5 μSEC	3680	74%	950
MM8-EJ	8K X 12 BIT 18 MIL MEMORY, 1.5 μSEC	2050	51%	1000
MRV11-AA	PROM/RDM MEMORY UNIT	210	55%	95
MNV11-BA	PROM MEMORY UNIT	390	55%	175
MS11-JP	16K MOS MEMORY 11/04-34	3450	70%	995
MS8-CB	32K 32 BIT MOS RAM, 4K CHIPS (M8417-BA)	3850	66%	1300
MSV11-DC	16K BY 18 RAM	500	30%	350
MSV11-DD	32K BY 18 RAM	500	15%	425
MS11-FP	8K 18 BIT MOS RAM (M7847-AD)	2250	89%	250
MXV11-AC	32KB RAM, 2 ASYNC EIA SLU SOCKET FOR 2-24 PIN 5V NOM (M8047-CA)	750	30%	525
MM11-VP	32K 18 BIT MEMORY ONE 1" BOARD	8500	78%	1890
MS11-LB	128KB MOS MEMORY FOR 11/34A	2400	30%	1680
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CMS11-JC	CM11 CONT + DOC TM600 MARK/HOLE SENSE CR, 600 CPM 120/60	11300	27%	8250
CTS11-JB	CARD TERM CONT, DECISION DATA 601B RDR/PUNCH, ASCII, 8-BIT HOLLERITH	5800	57%	2500
LP11-VN	[redacted]	[redacted]	[redacted]	[redacted] 6000
LP11-YE	LP06-YE + LP11 CON1 120/60	22400	42%	13000
LP11-ZE	[redacted]	[redacted]	[redacted]	[redacted] 13000
NP04-H	UNIT SELECT SWITCH KIT	1000	70%	300

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Houston's Museums

Greater Houston Convention & Visitors Council Photos

Spectacular celestial shows at the Burke Baker Planetarium takes viewers to other planets within seconds and reveal the secrets of the heavens.

(Continued from Preview/14)

stract expressionism as well as the pictorial, figurative style of most American regional work in the mid-twentieth century.

A healthy variety of styles, forms and ideas form the genre of work gathered in the exhibit "Some Contemporary Portraits." The exhibit surveys the long tradition of American and European portraiture while also reflecting on our contemporary period. Sculptors, photograpers, painters and video artists are included in this exhibit.

Gallery hours for the Contemporary Arts Museum are 10 a.m. to 5 p.m., Tuesday through Saturday. Admission is free. This museum is located at 5216 Montrose Boulevard, at the corner of Bissonnet and Montrose. The number for general information is 526-3129.

HOUSTON HERITAGE SOCIETY

This collection of restored 19th century buildings is a breath of fresh air for anyone on a "constitutional" in the northern fringe of downtown Houston with its cold steel and glass skyscrappers. This outdoor museum rests on 20 acres of grass and gives the visitor an idea of how Houstonians once lived.

The Heritage Society wasted little effort in creating this community of early Texas edifices. The buildings are complete with sidewalks, park benches and gaslights. One almost expects to see J.K. and A.C. Allen, the two New York brothers who founded Houston, walking down The Long Row, a reconstruction of an original structure built in 1837 under the leadership of the Allens. This structure is a long wooden row of small stores and shops. The original, which was destroyed by fire in 1860, was Houston's first business building.

After viewing The Long Row, one can visit the Heritage Society's other seven buildings, including the Kellum-Noble House (perhaps the oldest brick house in Houston), the Nichols-Rice-Cherry House (a Greek Revival-style home originally constructed around 1850), the Pilot House (an ornate, high Victorian-style home built in 1868 and occupied for a century by the Eugene Pilot family), Sam Houston Park Bandstand (this replica dates back to the turn of the century and is a prominent Houston landmark), San Felipe Cottage (the structure is typical of Texas cottages circa 1870), St. John Church (a wooden country church constructed by a colony of German farmers in 1891) and The Old Place (built in 1824, making it the oldest permanent wooden structure in Harris County — take a look at the roughly cut cedar planks).

The Heritage Society outdoor museum is open weekdays from 10 a.m. to 3 p.m. General admission is $2 (35 cents for children). It's located in Sam Houston Park at 1100 Bagby — you can't miss this picturesque patch of grass, but if you do telephone 223-8367 for directions.

SAN JACINTO BATTLEGROUND, MONUMENT, MUSEUM AND BATTLESHIP TEXAS

Let's hope you brought a camera and enough money for extra film because there's enough Texas history on this particular plot of Lone Star real estate to short-circuit the combined memories of a ten-gallon hat full of computer chips. We'll begin where it all began for Texas.

The San Jacinto Battleground is the site where the outmanned Texas army of General Sam Houston ambushed the superior forces of Mexican General Santa Anna in the decisive battle for Texas' independence. Walking around the various historical markers, one almost smells the gun powder and hears the faint cry "Remember the Alamo!" from the 18-minute battle, which occurred here 146 years ago.

The San Jacinto Monument stands 570 feet high — the tallest monumental column in the world. It was built by WPA workers in the 1930s. The monument, which is topped by a lone star that is 35 feet across and weighs 22 tons, is dedicated to those who fought for Texas independence.

The Museum of Texas History traces the state's history from the time of the Spanish explorer Cortez and houses maps, pre-Colombian artifacts, letters, lamps, guns, engravings, coins, weapons, pioneer tools, tintypes, costumes and much more. A great stop for museum buffs, history nuts and the just plain curious.

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The battleground, monument and museum are located off State Highway 225 E. and are open weekdays from 9:30 a.m. to 5:30 p.m. Admission is free. The Battleship *Texas* is open 10 a.m. to 6 p.m. General admission is $1, children are admitted for 50 cents.

ROBERT A. VINES ENVIRONMENTAL SCIENCE CENTER

The center is used mostly for teaching, but its four halls and arboretums are open free to visitors. A lava-bubbling volcano, a menacing polar bear pouncing on a defenseless bay seal, the muddy bottom of Houston's Buffalo Bayou and other fascinating science exhibits await you here.

The center's four halls include the Hall of Zoology, the Hall of Oceanography, the Hall of Geology and the Jack Roach Hall of Exotic Animals. There's also a nascent arboretum resting on five acres adjacent to the Science Center, which is open weekdays 8:30 a.m. to 5 p.m. and is located at 6856 Westview Drive. Telephone 465-9628 for further information.

ROTHKO CHAPEL

This ecumenical chapel is devoted to art and all world religions and is somewhat of a cultural shock for those who readily associate the Good Lord with lofty stained-glass and octagonal chapels. Inside the visitor finds 14 paintings by the late American artist Mark Rothko. The paintings are illuminated by a large skylight and change with the light, but always remain somber and mysterious.

Outside is *Broken Obelisk*, a sculpture by Barnett Newman. The sculpture is reflected in a large rectangular pool on the grounds.

The Rothko Chapel is open daily between 10 a.m. and 6 p.m. Admission is free, but reservations are required for large groups. The Chapel is located at 1401 Sul Ross. For more information telephone 524-9839.

RICE MUSEUM

This exhibit gallery is located on the Rice University campus. Its more prominent exhibits include an outstanding collection of Northwest Coast Indian art and "Art Nouveau Belgium/France."

The museum, located at the campus entrance on Stockton at University, is open free to the public Tuesday through Saturday between 10 a.m. and 5 p.m. Call 522-0886 for more information.

BLAFFER GALLERY

Devoted to top-flight exhibitions of works by local and international artists, the handsome gallery sits prominently on the campus of the University of Houston. You'll find the Blaffer Gallery at Entrace 5 off Cullen St. Admission is free, and the hours are 10 a.m. to 6 p.m., Tuesday through Saturday. Telephone the gallery at 749-1329 for further details.

BAYOU BEND COLLECTION

This renowned museum of American furniture and decorative arts from the Colonial days to the Victorian period is found in the mansion named after Miss Ima Hogg, who lavished cultural treasures on Houston after her death in 1975 at the age of 93.

The mansion is located at 1 Westcott and is open between 10 a.m. and 2:30 p.m. Tuesday through Friday. Admission is by appointment only. Tours are free but require a refundable $1 deposit per visitor when you make reservations. For reservations, telephone 529-8773.

A 220-ton, 85-foot-high masonry star — the symbol of the Lone Star State, sits on top of the San Jacinto Monument, the tallest masonry column in the world.

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From Honky-Tonks to Ballet

Houston at Night: A Potpourri of Texas Culture

By Henry A. de La Garza
Special to CW‡

Houston during the day may mean the National Computer Conference to you, but Houston at night is a potpourri of pubs and clubs, diners, discos and do-si-dos, plays and ballets with names like **Annabelle's, Brennan's, Cooter's, Cody's, Cardi's, Charlie's and Gilley's** — the world's largest honky-tonk where John Travolta rode the bull and won the girl in *Urban Cowboy*.

No doubt you'll plan your conference schedule carefully. Here's some suggestions in case you want to do the same for your social schedule when you're in Houston.

Gotta dance? Whether it's schottische or swing, two-step or three-quarter — Houston has it! If your boots are Tony Lama's and your hat says Stetson, then work up a sweat with Isaac Payton Sweat and the Texas Sweat Band at the **Winchester Club**, or hover under the huge wagon wheel and steer skulls at **San Antone Rose**, or hear the best of Hank Williams, Bob Wills, Willie and Wayland at **Fool's Gold** or join the uptown, clean-cut, country chic at **Cowboy**, where the dress code is designer rough-and-ready wear by Calvin Klein and Ralph Lauren.

Greater Houston Convention & Visitors Council Photo

They're called 'Gilleyrats,' and if you visit Gilley's Club next week, you'll probably see them dance to the Cotton-Eyed Joe beneath the 3.7-acre roof of the nation's largest country-and-western honky-tonk.

The designer name in authentic country-and-western honky-tonks is **Gilley's Club** in nearby Pasadena, where absolutely nothing comes between a cowboy and his longneck beer. A typical night at Gilley's will find more than 4,000 cowboys and cowgirls in their hand-tooled leather belts, reptile skin boots and horsehair hatbands crammed under a 3.7-acre roof and dancing the cotton-eyed Joe, riding the Gilley-patented mechanical bull, bustin' the electronic punching bags, playing pool or video games, struggling against the arm-wrestling machines or just marking time while the "Orange Blossom Special" brings the house down. ("Can ya two-step, cowboy? . . . Wanna prove it?")

Disco-pop fanciers have havens of their own in Houston. **Annabelle's** appeals to the sophisticated, over-30 free-wheelers who enjoy not-so-loud music and casual conversation. On the other hand, **The Copa Disco** offers a $100,000 sound system, plenty of mirrors and spectacular lighting. It pulsates to golden oldies and contemporary disco music.

The sound system is even more customized at **Elan**, where the age range is 25 to 35 and the music mix is a little of everything including classic disco, rock, country, greatest hits and top 40. And there's **Park Avenue Club and Cafe**, which offers three bars, two dance floors and a game room, and **Todd's**, which is the granddaddy of 'em all in Houston.

Rock and rollers can do their thing at **The Rocksy, The Rock Saloon** and **Cardi's**. Places like **Escape, Caribana** and **The Island** cater to new-wave enthusiasts. Those interested in big band sounds, middle-of-the-road music and prom night can enjoy a pleasant evening at ballrooms like the **Savoy Room, Polo's, Al Mark's Melody Lane** and the **Fred Astaire Dance Studio**.

Houston is home for a good variety of pubs and clubs suited to most pleasures. If you're hungry and thirsty, there's **Fat Ernie's, Freddy's Deli and Spirits, City Lights, Pinky Hull's Paradise Bar & Grill** and **Sam's Place Del Norte. Cody's, the Almanac Club, Houlihan's Old Place** and the **Lion Bar** are great for folks desiring some music and appetizers with their spirits.

Game players can play to their hearts' content at **Grand Central Station, Goofey's Game Room, Slick Willie's Family Pool Hall, the Airship Pub** and the **Winchester Club**.

Singles will find company at spots like **Judge's, Cooters, Remington Bar & Grill, Quincy's** and **Friday's**.

Quiet elegance is the tone at **La Nautile, La Colombe d'Or, the Hunt Room, Charlie's 517** and **Brennan's**.

On the wagon and in need of comedy on the rocks? Take in "The Show That Devoured Houston: A Cody from the Black Lagoon" playing now at **The Comedy Workshop**. A pair of comedians, Biff Maynard and Al Albert, are sharing the stage with a magician named Perk Tipkin at **The Laff Stop**.

It's a little more crowded on stage at **The Comix Annex**, where a troupe performs stand-up comedy routines.

If You Want to Call Ahead . . .

CLASSICAL MUSIC

Hamman Hall, Rice University, entrance 9 off of Rice Blvd., 527-4933.
Christ Church Cathedral, 1117 Texas, 222-2593.
Jones Hall, 615 Louisiana, 227-2787.
Cullen Hall, Cullen Music Building, University of St. Thomas, 4000 Mount Vernon, 522-7911.
1894 Grand Opera House, 2020 Postoffice, 1-763-6459.

COMEDY SHOWS AND CLUBS

The Comedy Workshop, 2105 San Felipe, 524-7333.
The Comix Annex, 1904 S. Shepherd, 524-7333.
The Laff Stop, 1952-A W. Gray, 524-2333.

THEATRE

Windmill Dinner Theatre, 390 Town & Country Blvd., 464-7655.
Tower Theatre, 1201 Westheimer, 522-2452.
Nina Vanes Alley Theatre, 615 Texas, 228-8421.
Stages, 709 Franklin, 225-9539.
Cultural Arts Council Theatre, Carillon W., 1001 Westheimer, 225-9539.
Chocolate Bayou Theater Company, 1823 Lamar, 759-9840.
Music Hall, 810 Bagby, 526-7311.

DISCO-POP

Annabelle's, 5060 W. Alabama, 960-8100.
The Copa Disco, 2631 Richmond, 528-2250.
Elan, 1885 St. James Place in San Felipe Green, 626-4393.
Park Avenue Club & Cafe, 2775 Fondren, 782-6111.
Todd's, 5050 Richmond, 626-5990.

COUNTRY WESTERN

Gilley's Club, 4500 Spencer Highway, Pasadena, Texas, 941-7990.
Winchester Club, 5714 Bissonnet, 667-7994.
Fool's Gold, 12845 Westheimer, 497-2501.
San Antone Rose, 1641 South Voss, 977-7116.
Cowboy, 5351 W. Alabama, 840-9720.

ROCK 'N ROLL

The Rocksy, 4060 Westheimer, 840-7111.
Cardi's, 5901 Westheimer, 789-4111.
The Rock Saloon, 5134 Richmond, 961-3530

NEW WAVE

Caribana, 2413 Rice Blvd., 524-6903.
The Island, 4705 S. Main, 520-9040.
Escape, 8670 S. Gessner, 981-9725.

BALLROOM

Polo's, 2088 S. Post Oak Blvd., in the Post Oak Central Building, 629-4420.
Savoy Room, 5011 Westheimer, 623-4327.
Fred Astaire Dance Studio, 3659 Fondren, 266-1890.
Al Mark's Melody Lane Ballroom, 3027 Crossview, 785-5301.

PUBS AND CLUBS
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La Nautile, Hotel Meridien, 400 Dallas, 759-0202.
Charlie's 517, 517 Louisiana, 224-4438.
La Colombe d'Or, 3410 Montrose, 524-7999.
Hunt Room, Warwick Hotel, 5701 Main, 526-1991.

APPETIZERS, ETC.

Cody's, 3400 Montrose, 522-9747.
Houlihan's Old Place, 1800 S. Post Oak Road, 621-1740.
Almanac Club, 7787 Katy Freeway, 682-1611.
Lion Bar, 5011 Westheimer, 623-4300.

GAMES OF CHANCE

Slick Willie's Family Pool Hall, 6467 Westheimer, 781-2215.
Grand Central Station, 5886 San Felipe, 780-9297.
Goofey's Game Room, 5241 Buffalo Speedway, 664-2945.
Airship Pub, 5500 El Camino Del Rey, 664-7127.

ODDS AND ENDS

Quincy's, Adam's Mark Hotel, 2900 Briarpark, 978-7400.
Remington Bar & Grill, 4608 Westheimer, 850-0451.
Judge's, 5250 W. Alabama, 627-3772.
Cooter's, 5164 Richmond, 961-7494.
Friday's, 5010 Richmond, 627-3430.

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If You're Planning To Shop for Souvenirs In 'Golden Buckle' . . .

By Henry A. de La Garza
Special to CW‡

Shopping in Houston for things to bring home from the National Computer Conference will be one of your more enjoyable and exciting activities. "The Golden Buckle of the Sunbelt" provides a cornucopia of shopping delights from the renowned and spectacular Galleria to the quaint, old world specialty shops.

If you want to sample Houston's downtown stores, there's an underground tunnel system that will keep you safe from the elements.

Here is a sampling of what you'll find in the Golden Buckle.

THE GALLERIA

Since its opening in 1970, The Galleria has set the pace among retail centers for innovation and excitement with more than 200 department stores, shops, restaurants, art galleries, theatres and an olympic-sized ice rink, all housed within a three-level, glass-roofed, air-conditioned, 1.4-million sq ft mall. There's enough parking space above and below ground for 10,321 automobiles.

Strolling through this "shopping center of shopping centers," one can feel the mall's European style as expressed by Milan's classic Galleria Vittorio Emanuele. The Galleria, developed by Gerald D. Hines Interests (Houston) and designed by the internationally known architectural firm of Helmuth, Obata and Kassabaum of St. Louis, encloses retail, hotel, entertainment and business facilities in a controlled environment thet is open to the sky under domed skylights.

Houstonians and visitors from all over the world are attracted to the Galleria by the likes of Neiman-Marcus, Gump's, Fred Joiallier, Tiffany & Co., Mark Cross, Lord & Taylor, Marshall Fields, Frost Brothers and specialty stores such as Charles Jourdan, Alfred Dunhill of London, Ted Lapidus, Au Chocolat, Holly's Harp, Gucci and Cartier.

The Galleria is located at the corner of Westheimer and S. Post Oak just west of Loop 610.

CITY POST OAK

City Post Oak, which is adjacent to and north of The Galleria on both sides of South Post Oak Road, is Houston's answer to Rodeo Drive in Beverly Hills.

It would take the most industrious and ambitious plastic-toting shopper forever to fully experience all of the fine stores and restaurants in City Post Oak and The Galleria. You'll find Saks; Sakowitz; Palais Royal of Houston, Inc.; Joske's; Everett-Buelow and Szor-Diener Furs; as well as a variety of places to eat with names like Houlihans and Hunan.

Just park your car anywhere and be prepared to leave loaded down with all sorts of goodies.

(Continued on Preview/24)

Greater Houston Convention & Visitors Council

Houston's downtown tunnel system connects 26 city blocks and provides an air-conditioned opportunity to sightsee, shop and dine.

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See us at NCC Booth 1017

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Shopping in the 'Golden Buckle of the Sunbelt'

(Continued from Preview/21)

DOWNTOWN TUNNEL SYSTEM

Walk underground in downtown Houston and shop in air-conditioned comfort. Leave your rented car or personal automobile back at the hotel and take a cab — Houston has a shortage of office space matched only by its shortage of parking spaces.

The tunnel system offers a path to many fine stores in downtown Houston. You can enter the tunnel system through any of the following buildings:

- Hyatt Regency Hotel ... 1200 Lousiana.
- One, Two or Three Allen Centers ... 500 Dallas.
- One Shell Plaza ... 900 Louisiana.
- Pennzoil Place ... 700 Louisiana.

TOWN AND COUNTRY VILLAGE

This tree-lined village is very different from most malls, but still affords shoppers a "head-scratching" selection of more than 100 department stores, shops, restaurants, dinner theatres, movie theatres and other businesses.

Shopping is easy to do here — just drive right up to the chosen place, park and walk in. Inside you'll find men and women's clothiers; children's shops; furniture stores; design studios; art galleries; jewelry, cosmetic and toy stores; tailors; gift shops; athletic equipment suppliers; record stores; and a large post office — just to name a few.

Complete your day's shopping by taking in the nearby Windmill Dinner Theatre, which is currently featuring James Whitmore and James Whitmore Jr. in "Sleuth."

Town and Country Village is located just off Interstate 10 at West Belt on the city's west side.

CARILLON WEST

Carillon West reminds the visitor of a colorful Italian village complete with bell towers, waterfall and waterwheel, red tile roofs and pleasant walkways.

This is the sort of shopping center where one can wear light outdoor clothing and soft shoes and enjoy some sunshine while meandering through outdoor ramps connecting the upper and lower levels of Carillon West's many stores, art galaries, antique shops and restaurants with names like Chili's, Foulards, The Hobbit Holl, Hunan East and Jacques, A Rotisserie.

Carillon West is located at 10001 Westheimer, a main east and west thoroughfare stretching from Interstate 45 through Interstate-610 West and out to Houston's westside area. The drive alone is worth the experience.

MEMORIAL CITY

Located just south of Interstate 10 and Gessner on Houston's west side, this sprawling shopping area offers more than 40 apparel stores, including Margo's LaMode, Adrien's, Brooks and Frost Brothers as well as 12 jewelry outlets like Corrigan's and Sweeney's.

There's also places specializing in hobbies and crafts, gifts and cards, home furnishings, shoes and restaurants.

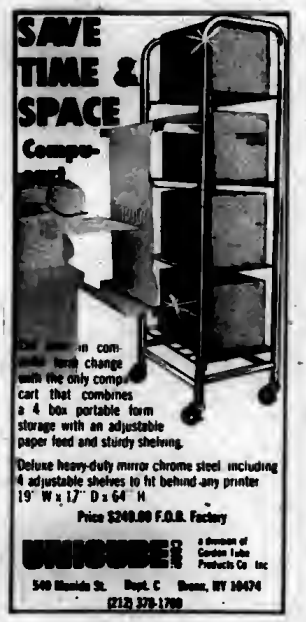
SHARPSTOWN CENTER

Sharpstown is close to your traditional looking shopping mall and is located at Bellaire Blvd. and 1-59 in Houston's southwest area. The Center is described as a shopping center for all seasons with more than 200 fine stores, restaurants and entertainment areas.

GREENSPOINT MALL

Greenspoint Mall features a center court with an overhead skylight and a waterfall surrounded by lush, tropical greenery, a Children's Court with a geometric play sculpture and The Patio, a cluster of 14 food services offering a tempting variety of menus.

Greenspoint is located at Interstate-45 North and North Belt on Houston's north side and is made up 132 excellent specialty shops and stores like Joske's and Lord & Taylor.



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Ready to Relax on 30 Miles of Sandy Beaches?

Greater Houston Convention & Visitors Council Photos

Galveston Island — known as the 'Miami Beach of Texas' — offers 30 miles of wide, sandy beaches including Stewart Beach, which features an amusement park, miniature golf course and a water coaster.

By Henry A. de La Garza
Special to CW‡

Europeans first discovered it in the early 1500s. The Karankawa Indians later called it home. The 19th century French pirate Jean Laffite made it his headquarters. A killer hurricane pounded it in 1900.

Galveston Island and its 30 miles of sandy beaches have seen a little of everything, and many say this "Miami Beach of Texas" offers a little something for everybody. So if you're looking for something different while attending the National Computer Conference, then this island resort, located less than an hour's drive from Houston on Interstate-45, may be just the spot. Here's a sampling of what to do and where to go in Galveston.

Points of Interest

Bolivar Ferry provides free ferry service between Galveston and Point Bolivar as well as an excellent opportunity to view Galveston Harbor, to visit Seawolf Park and to feed flocks of seagulls, which follow the ferry.

Galveston Island State Park is a beautiful 2,000-acre isle stretching from Galveston Bay to the Gulf of Mexico. The park features nature trails and observation towers and is ideal for bird watching.

Galveston Island Visitors Center, located at Seawall and 21st St., is stocked with information, brochures and maps. It is the departure point for the Treasure Isle Tour Train.

The Seawall, which runs along Galveston Beach and the Gulf for more than 10 miles, was built to protect the island from hurricanes. It is lined with hotels, motels, restaurants, cafes, gift shops and various attractions.

Museums

Ashton Villa has survived the Civil War, the 1900 hurricane and demoli-

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Retrieves batch print from POWER/VS queue, converts and prints on 3270-type terminal printer via CICS or SHADOW. Jobs may also be viewed on CRT. May be used to eliminate RJE printers. $4000 or $200/mo

BIMSPOON On-line to Batch Print Spooler
Used by DOS/VS(E) CICS/VS on-line application programs to create batch print reports under POWER/VS(E). Multiple tasks may create reports concurrently. If used with BIMSPOOL, reports may be spooled to 3270 terminal printers. $640 or $42/mo

BIM-ODIS DOS/VSE CICS/VS Status Display
Summary, detail, and analytic displays of CICS/VS, DOS, VTAM, and DL/I tables and control blocks. Used to determine CICS status and operational or performance problems. $2200 or $110/mo

BIMSERV DOS/VSE Library and VSAM Catalog Display
Displays directories and entries in all DOS/VSE libraries, VSAM Catalog, Label Area, and VTOC's (CICS). $1450 or $74/mo.

BIMTEXT Word Processing System
Create formatted documents from free-form input. Margin justification, numerous other formatting options, permit document changes without retyping other text. $2400 or $120/mo

BIMDSLOG DOS/VS(E) Console Hard Copy File Display
Used by operators or programmers to review DOS/VS messages via CICS or SHADOW without tying up system console. $720 or $36/mo

BIMMONTR DOS/VS(E) System Status and Status Display
The original and still best. DOS/VS(E) system activity, POWER/VS queue, and POWER/VS job output display system (CICS). Numerous options to assist operators and programmers. $920 or $46/mo.

BIMDEVC DOS/VS(E) Device Assignment Status
Displays logical unit assignments to devices (CICS). $360 or $18/mo.

BIMSUBMT DOS/VS(E) Job Submission Editing
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Nearby Galveston Promises a Panorama of Fun

Galveston Island was discovered by Europeans in the early 1500s, later inhabited by Indians and served as a pirate's headquarters.

tion since 1859. Today, Ashton Villa is a restored Italian mansion open to the public.

Galveston County Historical Museum is full of interesting exhibits from the island's history — Karankawa Indians, the Civil War Battle of Galveston, the 1900 hurricane and Jean Lafitte.

The Elissa is a square-rigged merchant sailing ship currently undergoing restoration.

Amusements

Sea-Arama Marineworld is a family entertainment complex featuring fun, education, excitement and mystery as well as performing dolphins, sea lions and tropical birds.

Seawolf Park, once an immigrant quarantine station, is today a restful tropical oasis where you can tour the World War II submarine "Cavalla," destroyer escort "U.S.S. Stewart" and other military hardware.

Beaches and Sports

R.A. Apffel Park is a wide, sandy beach featuring surf fishing, restaurants and a new 11,000-sq-ft recreation center with concessions, gift shop and bath house.

Stewart Beach is a beachfront picnic area covering 7.5 acres.

Airplane rides by Galveston Air Center, Inc. at Scholes Field Executive Terminal give visitors to Galveston a bird's-eye view of the island at reasonable rates.

Bicycle rental in single- and 10-speeds as well as surrey-type pedal vehicles and roller skates are another way to explore the seawall and cruise points of interest.

Fishing is something for which Galveston is famous. Special three-day fishing licenses give enthusiasts several fishing alternatives, such as deep sea, bay, pier, freshwater, surf, gigging and crabbing.

Camping on the beaches is permitted at designated areas, including West Beach near San Luis Pass Bridge and Galveston Island State Park.

Theatres

Strand Street Theatre at 2317 Mechanic is the island's only professional repertory company.

Lone Star Outdoor Musicals features Paul Green's "The Lone Star," the story of Texas' struggle for freedom, and Irving Berlin's "Annie Get Your Gun" on alternate evenings.

Restaurants

Gaido's, 2828 Seawall Blvd., is the oldest and most popular of all food establishments here and is great for Oysters Bienville, fresh shrimp, crawfish and steak.

Tuffy's, located on the South Jetty, is informal and small, yet picturesque for an evening meal.

Cafe Torre Fie, 114 22nd St., is noted for homemade food and an assorted menu.

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[illegible] best of all, it reduces computer room space re[illegible] to 50 percent.

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Telex 8020-2X Model 6 vs IBM 3420 Model 6 (savings based on 2-year lease).

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NOTE: Figures are based on published vendor specifications and prices. Rate pricing is estimated at a 7% increase in the last [illegible]. Telex is a 2-year fixed lease. Power consump[illegible] estimated at 5¢/kwh at a 12-hour-per-day [illegible].

[illegible] reduction is based on a 1x2 configuration of [illegible] only embedded controller, versus a 1x2 IBM [illegible].

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From Swamp to Sam Houston to Space City —

By Henry A. de LaGarza
Special to CW‡

Houston has been known by several names during its 145-year history including "Space City," "Energy Capital of the World" and "The First Capital of Texas." But long before man landed on the moon, energy became short and Sam Houston ambushed Santa Anna, the area that is now Houston was an untamed, unfriendly and uncomfortable swamp suitable only for mosquitoes, reptiles, cannibals and outlaws.

The first white man known to have braved the bayou area was a Spaniard named Alva Nunez Cabeza de Vaca who was shipwrecked with some companions on nearby Galveston Island in 1528. De Vaca and his party spent their first year imprisoned by island natives before escaping to spend the next five years trading with friendlier Indians and exploring the primitive lowlands of inland Texas.

Around the end of the 17th century, French traders making their way west from the Mississippi were enchanted to discover an abundance of game and pelts along the Gulf coast. French influence in the Houston area took a giant leap forward in 1714 when Louis Juchereau de St. Denis carved a trail between Louisiana and the Rio Grande and named it "Camino Real."

Little Appreciation

The Frenchman's gesture received little appreciation from Spanish rulers, who became alarmed by the growing French coast and the threat of English settlements along the Gulf coast. The Spaniards tried to reassert their authority, but domestic disputes on the European continent forced both the Spanish and the French to shift their priorities elsewhere.

As a result, Houston and the rest of Texas went virtually ignored until 1803, when Thomas Jefferson suggested that the Louisiana Purchase extend to the Rio Grande River. Spain's interest in the region suddenly resurfaced, and it spent the next 16 years contesting its claim to the territory.

In the years that followed, Houston became the home of renegades who ignored both governments and devoted most of their time to exploiting all manner of illicit commerce. One of the more notorious renegades was Jean Laffite, who preyed upon Gulf shipping and later developed a flourishing slave shipping operation. Plantations in Louisiana provided a constant market for Africans smuggled into the bayou area by Laffite and others who flagrantly violated a federal law banning importation of slaves.

It was Laffite's illegal trafficking in slaves that first attracted investors and settlers to the potential of the Houston area as an import/export center. The area's biggest advantage was a network of navigable streams and a chain of islands, which stretched between the Rio Grande and Galveston Island to form a natural canal and provide protection against Gulf storms. Houston's future as an inland port began to evolve.

Meanwhile, events south of the Rio Grande set the stage for Houston's designation as a city.

In 1821, Mexico won independence from Spain and the new Mexican government soon began exercising strict control over the Texas region, which had become the home of large numbers of Anglo-Americans. The next 15 years were marked by hostilities between the Mexicans and rebellious Texans.

Texas' independence came when

(Continued on Preview/29)

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"Ya Should've Bought T-bar, Harry."

Houstonians Find a City Without Limits

Greater Houston Convention & Visitors Center Photo

The Houston area, famous for its concentration of energy companies, lies near the center of the 13-county Coastal Prairie.

(Continued from Preview/28)

Sam Houston, general of the Texas Army, led a force of 800 men down the San Jacinto River on April 18, 1836, to a prairie near what is now the Port of Houston. There he discovered Mexican General Santa Anna and his 1,400 soldiers taking an afternoon siesta.

Using the element of surprise, Houston and his men poured into the Mexican camp in a blaze of gunshot and cannonfire lasting only 18 minutes. In that time Houston's outnumbered army killed or wounded 838 Mexicans and captured another 730 while losing only two of their own men. Afterward, Houston ordered Santa Anna to remove all Mexican troops located north of the Rio Grande River.

The Allen Brothers

Four months after the historic battle for independence, two visionary brothers from New York — Augustus C. and John K. Allen — purchased a 6,642-acre tract of mosquito-infested marshland along what is now Buffalo Bayou, which runs through the center of Houston. They plotted a city and named it after the hero of the Texas revolution, Sam Houston.

Savvy real estate promoters, the Allen brothers were certain that the General of the Texas Army would become the first President of the Texas Republic and that Houston would select their plotted city as the "first capital of Texas."

While quietly pursuing their visions for Houston, the Allen brothers began advertising for new residents. Their advertisements, which began to appear on Aug. 30, 1836 (and failed to mention that the city of Houston existed only on paper), were read as far away as Mobile, Washington, New York and Louisville.

Advantages Cited

According to the advertisement, the new city offered these advantages: "Vessels from New Orleans or New York can sail without obstacle to this place . . . There is no place in Texas more healthy . . . Nature appears to have designated this place for the future seat of government."

The advertisements worked very well, attracting people drawn by the promise of a new town. To the delight of the Allen brothers, these new arrivals came with their money in hand and ready to purchase a part of Houston.

As expected, Houston was chosen as the capital of the Texas Republic late in 1836. But Houston's new residents — contrary to the Allen brothers' claims — found the area's humidity, muddy swamps and mosquitoes uninviting. When Texas lawmakers grew weary of battling mosquitoes and yellow fever, they moved their capital in 1839 to Austin, located about 150 miles northeast of Houston in the drier, rolling hills of central Texas.

Despite this setback, Houston continued to prosper. By 1840, the town had become an incorporated city with a population of 1,200. Houston drained some of its swamps and replaced them with a town square, courthouse and a church. The first public schools opened soon after.

The decade witnessed Houston's formal beginnings as an inland port when the "Laura" became the first steamship to visit the city, traveling 15 miles upstream from the Gulf and docking on Buffalo Bayou. This navigational feat, which required the ship to slowly slip through narrow, winding and dangerously shallow waters, earned the city its designation as Port of Houston.

(Continued on Preview/30)

Reaching for Flexibility? T-bar

When it's time to reconfigure for a new task, or to overcome a problem, the demand is for instant and total flexibility.

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For increasingly dispersed data communication networks, T-Bar is producing its solid-state Virtual Switch Matrix, the VSM, for up to 256 x 256 interconnections. The VSM brings true switch characteristics and computer control capability to reconfiguration, back-up, monitoring and diagnostic testing demands. More importantly, it's flexible. The VSM allows instantaneous connection between any data terminal equipment and any data communications equipment anywhere in the network. And the connection can be effected from up to 10 supervisory control points located in different places.

For the computer room, T-Bar introduces flexibility with its 3900 computer switching series, a line of switches which expands in capabilities right along with your particular system. Since 1975, 3915 and 3916 channel switches have added flexibility through manual configuration, where that's appropriate. In more extensive installations, with a great number of peripherals and even where several 3915 or 3916 switches are already in place, instant flexibility comes from adding T-Bar's microprocessor-based 3919 Intelligent Matrix Control.

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T-Bar produced firsts in the seventies and eighties — Edge-To-Dome Contacts, the Virtual Switch Matrix technology, Computer/Peripheral switches.

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T-Bar's 3919 Intelligent Matrix Control

T-Bar's Virtual Switch Matrix — The VSM

See us at NCC

T-Bar, Inc., 141 Danbury Road, P.O. Box T, Wilton, CT 06897 Tel: (203) 834-8368

Houston's History: As Big, Bold and Brassy

(Continued from Preview/29)

The Port made more headlines in 1844 when a large steamship, the "Constitution," anchored at Houston for a brief stay.

One year later, Texas made news by becoming the 28th state of the Union. The Allen brothers, meanwhile, saw the population of their city grow to 4,700 residents. In 1847, however, 105 people were lost to a yellow-fever epidemic.

More city residents were lost to another epidemic in 1849 when many people caught gold fever and moved west to California to seek their fortunes.

While gold lured many west, cotton became king in Houston and the first railroads came to town in 1853, adding to the area's already prospering economy. The railroads gave Houston a competitive edge over other towns along the Texas coast.

Low Point

Houston's competitive edge eroded somewhat in 1860 when the Civil War erupted. Except for a brief occupation by Union troops in 1865, Houston was spared the full brunt of the war. Once the war ended, Houston returned to the serious business of prosperity by widening and deepening Buffalo Bayou so that more and bigger ships could anchor at the Port.

The 19th century closed quietly for Houston, giving little warning of two major events that would test the city's character early in the next century:

- On Sept. 8, 1900, nature turned its full fury against the Texas coast in the form of a hurricane packing 100 mph winds, a meteorological phenomenom remembered to this day as "the Galveston storm." The hurricane killed 5,000 Galveston residents and left the town submerged in water for weeks. Houston fared better with only 60 mph winds that left one dead but heavily damaged property throughout the city.
- Area residents were still staggering from the hurricane's destruction when oil was discovered in January 1901 at Spindletop Field in nearby Beaumont. Word of the discovery spread like wildfire to the rest of the country. Overnight, Houston became one of the world's great oil centers. Four large tanks were quickly built to store the oil pumped from Spindletop, and city fathers wasted little time promoting Houston's importance as a center of distribution where "17 railways meet the sea."

Cadre of Con Men

The oil frenzy amplified each year afterward. Houston became inundated by lease hounds, oil companies and a cadre of con men. Men gambled their fortunes on new exploration and development, gobbling up land and oil rights like frantic shoppers at a fire sale.

Houston's oil boom was still in its infancy in 1905 when the city's ship channel was finally widened and deepened, completing 36 years of construction and marking the Port of Houston's emergence as a major American trade center. The Port could now accommodate any sailing vessel in the world.

Buoyed by its oil and cotton industries as well as by its rail and port facilities, Houston was able to survive the Great Depression, which brought the rest of the nation's economy to its knees. The city felt no more than an economic pinch — and that not until 1933, when building activity showed a decline. Three years later, the Depression ebbed and the city's economy looked none the worse for wear; port activity increased, grain elevators were full again, construction resumed its earlier pace, oil and cotton prices moved upward and city fathers began to prepare for Houston's centennial.

In 1936, Houstonians celebrated their city's centennial with real pride, though few could imagine that the great events of the first 100 years — Texas' independence, the Port of Houston, the Galveston storm and Spindletop — were harbingers of even greater times to come.

By 1940, Houston's population stood at 350,000 and its land area spread across 73 square miles. It would swell to 1.3 million people and more than 450 square miles during the next 20 years, a period of phenomenal growth and extraordinary accomplishment for the city.

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As Its Skyscrapers, Cowboys and Oil Magnates

Houston's economy began to diversify by 1950. The Port of Houston soon had more business than it could handle and faced the prospect of losing some business to other competing American ports.

In 1956, city voters appropriated funds for new rail facilities and the U.S. Army Corps of Engineers began exploring how to further widen and deepen the entire ship channel to 40 feet, a depth which would accommodate the largest ocean vessels. Work on the Port was eventually completed, making it possible for the Port's emergence in the 1970s as America's leading port in terms of foreign tonnage.

In the mid-1950s, attention in Houston and elsewhere was turned skyward as the Soviet Union rocketed a tiny satellite into orbit around the earth. The event posed a great challenge for the U.S. and signaled the beginning of a "Space-Age Spindletop" for Houston.

As the space race gathered momentum, Houston was selected as the home for the National Aeronatics and Space Administration's (Nasa) Manned Spacecraft Center, which was attracted by the area's weather, industry, transportation facilities and science and research centers. The Port also offered a special advantage because it provided a convenient means to transport bulky space vehicles to Cape Canaveral and other Nasa sites.

In July 1969, Houston's name became identified worldwide with America's space effort when astronaut Neil Armstrong announced to the world that man had landed on the moon. Armstrong's first words back to earth were, "Houston, Tranquility Base here. The Eagle has landed."

Suddenly, Houston had a new nickname — "Space City U.S.A." — which now is emblazoned on the arm patch of every Houston police officer's uniform.

Today, Houston is a city virtually without limits, described in 1981 by *Forbes* magazine as "a city skyrocketing its way to the 21st century." Many analysts agree that Houston, currently the nation's fifth largest city, will be the largest in the year 2000.

Houstonians believe their prosperous city is the "envy of the nation" and their belief is supported by the fact that Houston is the "Golden Buckle of the Sun Belt." Among Sun Belt cities, Houston boasts the lowest unemployment rate (4.0%), the highest personal income, the most financially sound municipal government (the City of Houston has triple-A ratings from both Moody's and Standard & Poors), the most prosperous economy ($3 billion in building permits in 1981) and the largest international community (50 nations have foreign consulates in Houston).

The quality of life in Houston can be measured by its cultural and entertainment facilities and its world-famous Texas Medical Center, which attracts an estimated 6,000 patients from all over the world to Houston hospitals in search of the most advanced medical attention.

As for the future, Houston is well on its way to becoming the nation's most successful city. That's great news for a city that is just 145 years young.

Greater Houston Convention & Visitors Council

This statue of Gen. Sam Houston is located at the entrance to Houston's spacious and beautiful Hermann Park.

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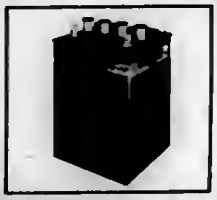

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Series 5000 is faster and much more powerful than any computer Four-Phase has ever built. Yet it is compatible with existing Four-Phase software, including Corporate Office Management System, our new office automation package. COMS/IV incorporates electronic mail, office functions, data processing, and communications into a single integrated system.

The FASTRAK terminal is a true multifunction workstation. For instance, your secretary can switch from word processing to conference scheduling with one keystroke. At the same time, you can record and send a spoken message, examine and revise a graph in a report, or even instantly turn your terminal into a powerful personal computer that supports the CP/M® operating system.

The Series 5000 and FASTRAK workstation are available in several models. For maximum cost-effectiveness, you can tailor different systems within the same network to match specific needs. And if you have already begun piecing an office automation system together, you will be glad to know that Series 5000 systems can interface with peripherals from many office equipment vendors.

Your Four-Phase equipment is supported by one of the most extensive service networks in the industry. More than 1000 field engineering personnel in over 150 locations across the continent provide a level of expertise unique in the industry.

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CP/M is a registered trademark of Digital Research, Inc. Corporate Office Management System, COMS/IV, and FASTRAK are trademarks of Four-Phase Systems, Inc.

See us at NCC. Booth #2503.

Office Automation Company.™

Software at NCC

Cincom Systems, Inc.

Cincom Systems, Inc. will exhibit its line of data base/data communications and application software products for IBM and plug-compatible mainframes at Booth 3010.

Particularly featured will be enhancements to its Series 80 Mantis on-line application development package and to its Manufacturing Resource Planning System (MRPS).

Release 3.0 of Series 80 Mantis reportedly features a logical data base management system (DBMS) View, import/export reorganization utility, printer support, pseudoconversational CICS and support for Vtam environments under Cincom's Environ/1. It is priced at $8,000 plus $750 installation and $1,200 annual usage.

The MRPS package now includes real-time processing capabilties, the vendor said, and is intended to use Cincom's Series 80 Environ/1 or IBM's CICS. It is priced at $5,000.

Among the other products Cincom will display are its newly announced version of MRPS on Digital Equipment Corp.'s VAX superminicomputer line. This package requires Cincom's Minicomputer Total DBMS and DEC's Forms Management System and is available for $52,000. The recently announced version of its Total DBMS on Data General Corp.'s Eclipse system will be on exhibit and is available for $24,600 with an additional $2,000 installation fee.

Cincom Systems, Inc. is located at 2300 Montana Ave., Cincinnati, Ohio 45211.

SAS Institute, Inc.

SAS Institute, Inc. will demonstrate its SAS/Full-Screen Product (FSP) and announce the availability of SAS on IBM and plug-compatible systems running under DOS/VSE in Booths M106 to M108.

Designed for SAS users with IBM 3270 terminals, SAS/FSP enables users to define screens to look like order entry forms or invoices; and data can be entered into SAS data sets for data management, analysis and reporting. The letter-writing facilities reportedly allow users to compose, edit, manage and send letters on the IBM 6670 or 3800, the Xerox Corp. 5700 or 9700 or standard line printers.

SAS/FSP is available for $2,000 the first year and $1,500 each subsequent year for the first CPU.

SAS itself runs on IBM or plug-compatible mainframes in batch under OS and OS/VS, interactively under VM/CMS and TSO and, now, under DOS/VSE. It is available for $5,000 for the first year and $2,500 for each subsequent year for the first CPU.

Other SAS products to be exhibited include SAS/Graph ($3,000 for the first year and $1,500 thereafter for the first CPU); the SAS/Econometrics and Time-Series Library ($2,000 for the first year and $1,000 thereafter for the first CPU); and SAS/IMS-DL/1, a DL/1 interface that provides access to batch IMS/VS or CICS/OS/VS data bases ($3,000/year for the first CPU).

SAS Institute, Inc. is headquartered at SAS Circle, Box 8000, Cary, N.C. 27511.

Boole & Babbage, Inc.

Boole & Babbage, Inc. will announce a family of capacity management software packages for users of IBM and plug-compatible mainframes at Booth A649.

Developed under the working name of "Gamma," the product family will be known as the Capacity Management Facilities (CMF). The first products targeted for completion are the CMF/PDB (Performance Data Base); the CMF/Model and the CMF/Workbench. The anticipated prices for these packages are $20,000 for the CMF/PDB; 25,000 for CMF/Model; and $45,000 for all three, including the CMF/Workbench, which currently is not priced separately.

Other elements of the CMF software line will manage data sources, data presentation and work load characterization, the vendor said, noting that the CMF family of products consists of a comprehensive, integrated capacity management system.

Boole & Babbage, Inc. is headquartered at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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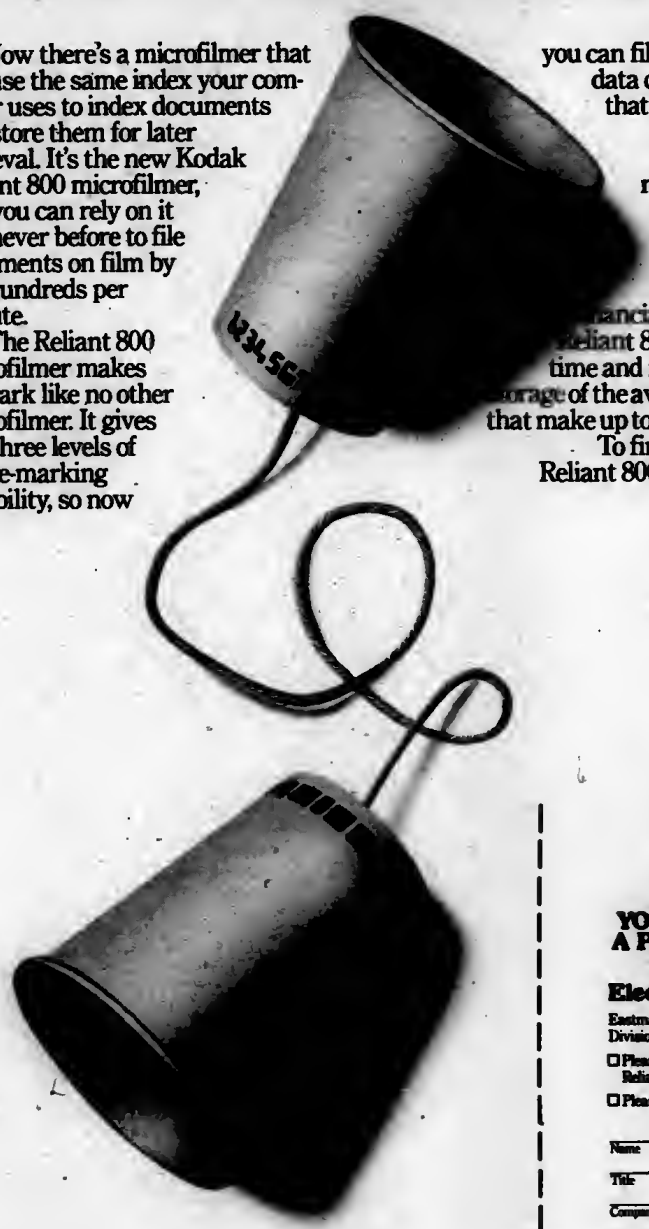

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Software at NCC

Management Science America, Inc.

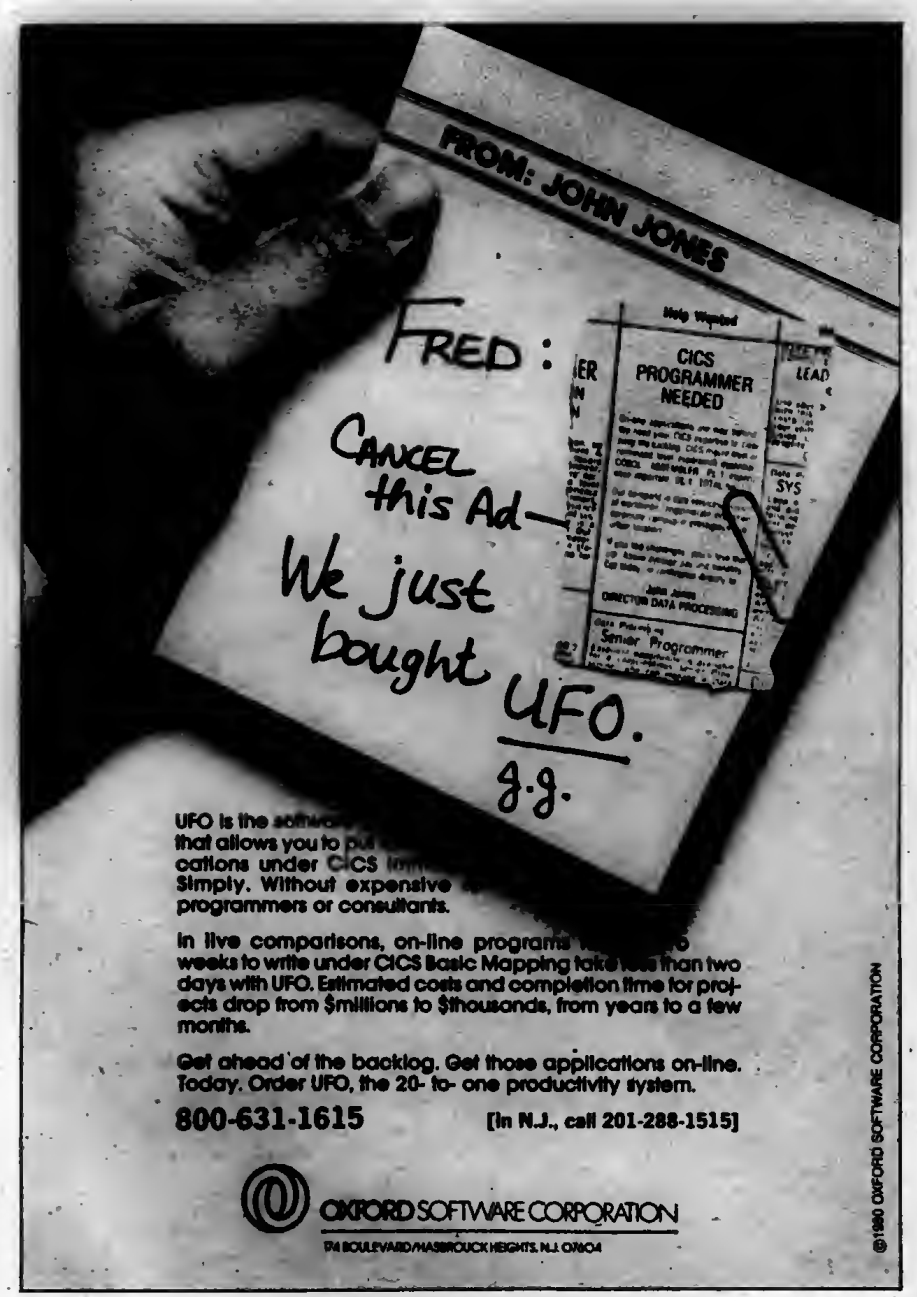
Management Science America, Inc. (MSA) will display its integrated line of manufacturing, human resources, cash and financial management packages for IBM and plug-compatible systems at Booths M121-M222.

Also on display will be its Peachtree Software Division's products for microcomputers in the areas of word processing and general accounting systems.

Among MSA's products for manufacturing are capacity requirements planning, inventory records control, master production scheduling and material requirements planning packages. The vendor'a human resources packages include payroll and personnel software.

Its cash management offerings include accounts receivable, accounts payable and purchase order control and inventory purchasing. Fixed assets accounting, general ledger/financial information and control, and financial forecasting and modeling packages make up its financial management software line.

MSA is headquartered at 3445 Peachtree Road, N.E., Atlanta, Ga. 30326.



Contel Information Systems, Inc.

Contel Information Systems, Inc. will introduce its Mpmath and Share-Eleven software packages and the Worksystem, a joint product with Tymshare, Inc., at Booths 922 and 923.

Mpmath is a library of Fortran-callable macro subroutines for the manipulation of fixed-point numbers on Digital Equipment Corp. PDP-11 and LSI-11 systems running under the RT-11, RSX-11M, TSX-Plus or Star-Eleven operating systems. It is priced at $250.

Star-Eleven is the DEC local-area networking system that links multiple DEC PDP-11 and/or LSI-11 computers under an RT-11 environment.

Share-Eleven is described by the vendor as a multiuser implementation of DEC's RT-11 operating system designed to run on Star-Eleven satellite systems. Star-Eleven is priced at $1,000.

The Worksystem is Tymshare's Dynasty Model 60 system that reportedly is based on DEC's LSI-11/23 processor. The Worksystem can address up to 1M byte of random-access memory and runs the Workware software package consisting of DEC's RT-11 operating system with the TSX-Plus multiaccess monitor. The Worksystem is priced at $35,600.

Contel is located at 130 Steamboat Road, Great Neck, N.Y. 11024.

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TSC DATA TERMINALS (201) 245-6333
WESTWOOD ASSOCIATES, INC. (201) 376-4242
J.J. WILD, INC. (617) 449-5600

See us at COMDEX Booth #548, and NCC Booth #2114

Software at NCC

On-Line Software International, Inc.

On-Line Software International, Inc. will introduce Insyst, an application program generator for the IBM CICS environment, in Booths M256 and M258.

Designed for users of IBM or plug-compatible systems in a CICS environment running under both DOS and OS, Insyst is said to enable entry-level programmers to store file descriptions and to define applications for on-line execution by end users. Programmers specify requests by filling in blanks on an IBM 3270 terminal.

The software reportedly allows programmers to customize screen formats without requiring IBM's Basic Mapping Support or CICS program table changes. Scheduled for release June 1, it is priced between $15,000 and $18,000.

The vendor's exhibit also will feature Datavantage, an IBM IMS data base productivity aid designed to assist data base administrators or testing control groups in creating and managing complex data base environments. Compatible with IMS DB/DC, CICS/DL/1 and IMS batch systems, Datavantage reportedly supports all OS/VS users and sells for $30,000.

"Quick Start-Up Kit," management guidelines for planning a pilot test program for evaluating the vendor's Omnicom electronic mail system, will be included in the National Computer Conference presentation. The cost of Omnicom, including the "Quick Start-up Kit," is $25,000.

Guardian and Intertest, two CICS-based packages, also will be on display. Guardian is a security system designed for transactions, programs, files, terminals and data base management systems such as IBM's DL/1; Cincom System, Inc.'s Total; and Cullinane Database Systems, Inc.'s IDMS. It costs $15,000 for DOS versions and $22,000 for OS systems.

Intertest, an interactive testing and debugging package for CICS systems and applications, costs $19,000 on a permanent license.

On-Line Software International is located at 65 Rt. 4 E., River Edge, N.J. 07661.

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APPLICATION DESIGN	NYC 6/1-4	NYC 7/26-30	—
COMMAND LEVEL PROGRAMMING	NYC 6/14-18	NYC 7/12-16 CHI 7/19-23	NYC 8/9-13
COMMAND LEVEL INTENSIVE (2 wknds)	NYC 6/19-20 & 26-27	CHI 7/17-18 & 24-25	NYC 8/7-8 & 14-15
MACRO LEVEL PROGRAMMING	NYC 6/21-25	—	—
INTERNAL ARCHITECTURE	NYC 6/28-7/2	NYC 7/26-30	—

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A Division of INTEGRATED COMPUTER SOFTWARE INC

Software Design Associates, Inc.

Software Design Associates, Inc. will exhibit its professional services, software productivity packages and learning services at Booths A536 and A538.

Featured will be a demonstration by the firm's products division of the capabilities of CL/1, its high-level nonprocedural CICS Cobol program generator. Designed to provide users with a library of precoded, standardized and pretested Cobol code, CL/1 is compatible with IBM, Sperry Univac and Honeywell, Inc. systems. It is priced at $41,000 for an on-line installation; annual maintenance is $4,100.

Software Design's Learning Services Division will display its customized technical and management programs, including its approach to training data processing managers.

The firm is located at 260 Madison Ave., New York, N.Y. 10016.

Comshare, Inc.

Comshare, Inc. will feature its microcomputer software — Masterplanner and Plannercalc — along with its color graphics software, Image Maker, at Booth A643.

A "Calc Wars Just Ended" theme will be used to introduce Plannercalc, which will be offered for $50 for a limited period, rather than at its $195 price tag. It is a "gridsheet" micro planning product that uses English language syntax.

Masterplanner, priced at $495, was developed for sophisticated users who need larger matrix capacity.

Image Maker was designed to allow users of Apple Computer, Inc.'s Apple Plot or Apple Business Graphics to order high-quality color paper copies, overhead transparencies or 35mm color slides over a telephone line. It is priced at $175. Comshare is located at Suite 200, 1935 Cliff Valley Way, Atlanta, Ga. 30329.

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Let TAC's IntelliCOMM™ SM/4A four channel statistical multiplexer be your "main squeeze" for data concentration. No more complex configuration documentation and confusing switch settings... Non-technical personnel can plug in the SM/4A, watch for tutorial prompting signals, specify configuration variables, and the system is up and running! The user never has to open the enclosure for installation or operation.

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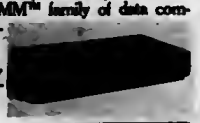

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STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution has made the software fault tolerant solution obsolete.)

"If you drive down the cost of physical hardware, you can make typically redundant paths for less money. Not surprisingly, most redundancy breakthroughs that will occur happen in hardware rather than in software.

You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue.

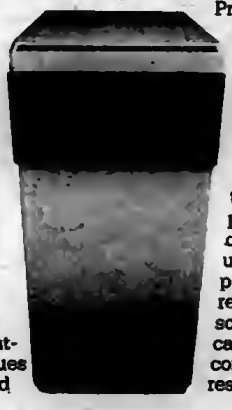
STRATUS/32 – SYSTEM HIGHLIGHTS

1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

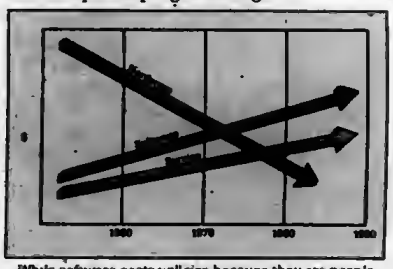
Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information occurs at four levels: operating system, user program, file management, and terminal control.



Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two. Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

With the software based solution the system designer and programmer is working with two computers. (An environment unfamiliar to most designers and programmers.) This approach requires more experienced personnel, takes more time for application development, requires continual maintenance, and as a result is more costly.

$130,000 – Software included.

The Stratus concept could not have been executed 10 years ago, 5 years ago, or even 2 years ago. It is possible now because of the dramatic price drop of hardware components. Because of this lower cost of hardware, and because of the simplicity of its architecture, Stratus can offer Continuous Processing™ at a price competitive with traditional systems that don't offer this capability. A fully duplexed configuration with 2 megabytes of memory, peripherals, and software can be purchased for under $130,000.

Don't overlook our software.

To complement our hardware approach to Continuous Processing we have an impressive list of software. For instance: Virtual Operating System (VOS), Transaction Processing System (TranPro), Data Management System, CRT oriented command language, Cobol, Basic, PL/I, Fortran, Pascal, Networking using X.25, IBM Communications, full screen editor, symbolic debugger, forms designer and a complete Word Processing package.

If your application requires total reliability, if you are considering any kind of dual-processor configuration or if you're considering Tandem, then you should fill out our coupon or call Nick Bologna, Director of Product Marketing 617/653-1466.

See us at NCC booth 2732

Stratus Computer, Inc. CW3
17 Strathmore Road, Natick, MA 01760

Name _____
Title _____
Company _____
Type of Business _____ Phone _____
Address _____
City _____ State _____ Zip _____

Stratus
CONTINUOUS PROCESSING™

Software at NCC

IMSL, Inc.

IMSL, Inc. will introduce its Stat/Protran statistical analysis and Math/Protran mathematical problem-solving package at Booths 3418 and 3419.

Stat/Protran was intended to reduce statistical problem-solving time and reportedly covers areas such as basic statistics, frequency and cross tabulation, correlation, regression analysis, analysis of variance and random-number generation.

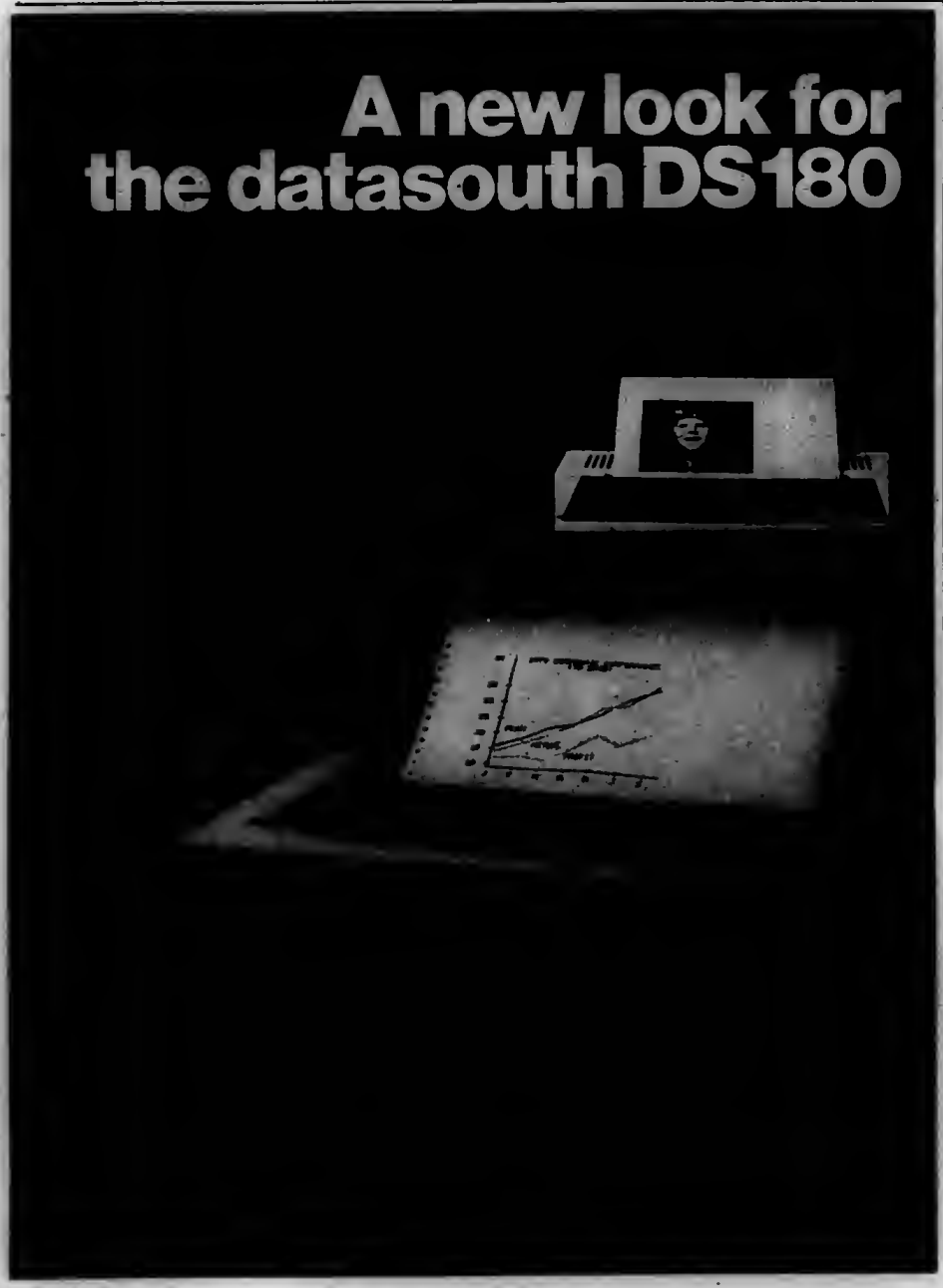
Math/Protran was designed for performing the mathematical applications of approximation and smoothing, data fitting, differentiation, integration and other functions.

Both systems are available for IBM and plug-compatible mainframes, as well as equipment from Control Data Corp., Digital Equipment Corp. and Data General Corp.

Annual subscription rates are as follows: Math/Protran initial ($3,000), renewals ($2,000); Stat/Protran initial ($2,500), renewals ($1,500); and both initial ($4,500), renewals ($3,000).

IMSL also will be exhibiting its Twodepep finite element program for solving partial differential equations. This package's annual subscription cost is $2,000 for a Type 1 computational system, $1,500 for a Type 2 computational system and carries an initial subscription charge of $500. The IMSL Library of Fortran subroutines, which will be on display, carries an initiation fee of $500. Its subscription costs are $2,500 for Type 1, $2,000 for Type 2 and $1,500 for Type 3.

There is a special price list for universities on all IMSL products, the vendor noted from 7500 Belliare Blvd., NBC Building, 6th Floor, Houston, Texas 77036.



Grumman Data Services, Inc.

Grumman Data Systems Corp. will be exhibiting its transition services and custom software development techniques at Booths A634 and A636.

The firm's transition services consist of the conversion of existing data processing applications from one operating environment to another. This is intended to allow the functional aspects of a software system to remain unaltered while the operational aspects of the system are changed, thereby extending the useful life of a software system rendered incompatible by a product or configuration change.

The custom software development services offered by Grumman were designed to provide specialized data processing software systems and services on a contractual basis for government, business and industry.

Grumman is located at 150 Crossways Park W., Woodbury, N.Y. 11797.

Uniq Computer Corp.

Uniq Computer Corp. will demonstrate its Unix System III operating system, a "look-alike" for Bell Laboratories, Inc.'s Unix operating system, at Booths 8004 and 8005.

Unix System III was designed to run on Digital Equipment Corp. PDP-11 and VAX systems, a spokeswoman said.

The vendor said the operating software is fully supported through its Remote Technical Assistance Center (Rtac).

This provides a warranty on the operating system, plus gives users access to the Rtac center for telephone support if their system goes down.

Unix System III is available for $6,000, according to a vendor spokeswoman.

The vendor is located at 28 S. Water St., Batavia, Ill. 60510.

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New extra-convenience features for terminal versatility.

We developed our new Model 16, 24-line x 80-column smart terminal to set a new standard in convenience. The result is Hot Buttons: exclusive design characteristics which provide unparalleled flexibility and operator authority.

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For the first time, you're master of both the keyboard and the display. Boss it around.

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Tell the time, right from the terminal screen. This Hot Button feature provides accurate, digital printout of the time of day or elapsed time. Use it to keep a concise work log. Or just to keep your own important schedule. Time does pass, but with the Model 16, it doesn't have to go unnoticed.

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Add, subtract, multiply, or divide. Whatever your office calculator did for you before, the Model 16 Hot Buttons do for you now, with convenient display on line 25. Reduce work station clutter by eliminating the need for additional equipment. Keep accounting capability at your fingertips.

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That's what you really want in your terminal. And that's what Teleray's Model 16 delivers. You get all the innovative ergonomical and functional features of our previous models. Full editing capability. ANSI X3.64 compatibility. Plus four pages of display, horizontal and vertical scrolling capability, line and mosaic graphics, and Hot Buttons—unique characteristics that make our Model 16 the smartest terminal in its class. All standard. Designed for convenience. Designed for you.

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The Model 16 with
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Software at NCC

Information Processing, Inc.

Information Processing, Inc. will be at Booths 2926 and 2927 at the National Computer Conference to demonstrate Version 5.0 of its Blis/Cobol operating system, which reportedly supports up to 2M bytes of main memory and additional system enhancements.

Blis/Cobol is described by the vendor as a multiuser, on-line operating system for Data General Corp. Nova and compatible systems.

With Blis/Cobol's expanded main memory and virtual memory capabilities, up to 30 users can each run up to 200K-byte Cobol programs without any modification on CPUs using either 16-bit extended memory addressing (128K bytes) or up to 2M bytes of mapped memory, the vendor said, claiming they also can achieve an increase in throughput.

Other enhancements included in Version 5.0 of Blis/Cobol include 2K-byte screen records, programmable CRT function keys support, CRT block mode transfers, cursor control features and alternate sector support.

Blis/Cobol is priced between $830 and $10,000, depending on the number of users and features. It is available from Information Processing, Inc., headquartered at 1850 Lee Road, Winter Park, Fla. 32789.

Micro Focus, Inc.

Micro Focus, Inc. will be exhibiting its Cobol compilers and utility packages for both its 8- and 16-bit microcomputers at Booth A714.

CIS Cobol, which is described by the vendor as an Ansi-74-standard minicomputer-level Cobol compiler for microcomputers, is available for $850.

Level II Cobol, priced at $1,600, will be available in June for Digital Equipment Corp. LSI-11 systems running under RSX-11, as well as for 8- and 16-bit micros, the vendor noted.

Cobol Animator is an interactive programming and debugging tool reportedly designed to display a Cobol program's source code on a CRT screen, as well as enable the programmer to watch it execute, according to the vendor.

Cobol Animator reportedly will be available in June for use on any system that runs CIS Cobol or Level II Cobol.

Its single-user price is $400 for the CIS Cobol version and $800 for the Level II Cobol version, according to the vendor.

Slideshow, which will be available in July, reportedly allows software designers to link Cobol programs, menus, graphics screens and text screens to create application packages. Also it is said to guide the user step-by-step through the desired application.

It is priced at $400 for use on any systems that runs CIS Cobol or Level II Cobol.

Forms-2, priced at $200, is a screen formatter for use on CIS Cobol- or Level II Cobol-based systems, said the vendor.

Fileshare, a record- and file-locking utility reportedly designed to complement Digital Research, Inc.'s MP/M operating systems, is available for $400, according to a vendor spokeswoman.

Micro Focus is located at 1601 Civic Center Drive, Santa Clara, Calif. 95050.

HARD FACTS ABOUT... systems utility & software

You'll be spending more and more of your systems dollars for it and creating more and more of your own business solutions with it.

Manufacturers are realizing that software will drive the hardware revenues of the future. As software was formerly written to sell hardware, so hardware will soon be built to sell software. You are probably realizing that more of your hardware choices are being made on the basis of what software packages you'll need.

Computerworld's June 28 Special Report on Systems and Utility Software will give you the kind of information you need to make informed software choices. You'll be able to identify configurations similar to yours and access the solutions. Here's a look at exactly what you'll get:

- *Applications stories and tutorial articles from users who'll share their experiences with the latest software packages.*
- *Guidelines for selecting system software.*
- *Market Trends: You'll read what people are buying now — and why.*
- *"How To" articles like "How to use Systems and Utility Packages to combat downtime . . . to reduce paperwork and improve management . . . to do testing and test planning . . ." and more.*
- *A close look at "new" topics like UNIX and ADA.*
- *A new look at some old topics, like COBOL, with an eye to improving efficiency.*

You'll also read about what to look out for, including the legal implications of contracts — and — you'll get a checklist for contracting that will be particularly useful when you have packages from more than one vendor.

And if you sell Systems and Utility Software, here's where your buyers will be on June 28th — reading *Computerworld's* "Systems and Utility Software" Special Report. Shouldn't they be reading about your product too? Ad close for this Special Report is June 11.

Contact your local sales representative at one of the offices listed below, or call Frank Collins, advertising administrator, at (617) 879-0700.

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- 80 or 132 Column Display
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Until now there's been quite a war going on over prices and features in the terminal industry. Until now, that is—the competition just lost, hands down.

For years, Lear Siegler has set the standards of the industry. Dumb and smart. And the competition has worked hard to imitate them.

But these new prices and performance features are the toughest standards anywhere. Bar none. So it's back to the drawing boards for everyone else in the industry.

Meanwhile, Lear Siegler is featuring a complete family of low priced, high performance terminals with attached or detachable selectric keyboards, white or green screens, Dumb or smart.

The detachables offer extra memory and accept an extra board for speech, graphics, modems, controllers or additional memory. Options include 15" screens and a convenient tilt mechanism.

So if you've been holding out, waiting for the right prices and features, give in.

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Dumb Terminal is a registered trademark of Lear Siegler, Inc. Quantity One U.S. Prices

Software at NCC

Battelle Memorial Institute

Battelle Memorial Institute will be displaying its Basis data management system and Basis-DM data base management system (DBMS) at Booth 1918.

Basis is an interactive on-line information storage and retrieval system designed to operate on IBM and plug-compatible mainframes as well as systems from Sperry Univac, Control Data Corp. and Digital Equipment Corp.

It reportedly has the capability to handle multilingual applications, alphanumeric data and very small or very large data bases.

Prices for Basis start at $26,600 for minicomputers and $38,000 for mainframes. It is sold on a modular basis.

Basis-DM is a dictionary-driven DBMS, the vendor said, which allows for hierarchical, network and relational data models.

It uses an inverted list access method of indexing to facilitate on-line retrieval and includes a report writer that reportely handles long textual elements.

Basis-DM will be available in September and is priced beginning at $29,000. It will run on the DEC VAX-11/780, VAX-11/750 and IBM 4300 series equipment.

Battelle Memorial Institute is located at 505 King Ave., Columbus, Ohio 43201.

ISE

ISE will display its data base management system (DBMS) and utility software packages for microcomputers and Digital Equipment Corp. LSI-11 minicomputers at Booth 3745 when the National Computer Conference opens next week.

MDBS.III is the firm's DBMS for 8- and 16-bit microprocessor-based systems and DEC LSI-11 minis.

MDBS.III includes QRS.III, a Query Retrieval System; and RTL.III, a Recovery and Transaction Logging System.

The base MDBS system can be leased for between $1,800 and $36,000.

Its Design Modification Utility can be leased for between $1,140 and $11,400; the rental fee for its Interactive Data Manipulation Language ranges from $360 to $6,410.

QRS can be leased for between $900 and $16,020. The rental fee for RTL ranges from $1,800 to $18,000.

The complete MDBS package, including MDBS, RTL and QRS rents for between $3,800 and $53,000. The prices for these products depend on configurations.

MDBS.I, a DBMS intended for 8-bit microprocessors, can be leased for $1,000. This system's QRS, Dynamic Restructuring System and RTL system are add-on packages that can each be rented for $360.

The complete MDBS package is presently available for a rental fee of $1,900.

The vendor is located at 350 Sagamore Pkwy. W., West Lafayette, Ind. 47906.

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Then and today...
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Announcing the PILLER 40 KVA power system for IBM system 3081*...the only 40 KVA power system that meets IBM specifications—and—incorporates PILLER's exclusive paralleling design.

This permits redundant operation of two or more PILLER 40 KVA Frequency Converters to support single or multiple 3081 CPU's, expandable on a modular basis.

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*Also meets specifications for AMDAHL System 580.

All this at a cost that is competitive with the IBM Model 3089 power unit.

Today, as then, PILLER offers more 60 Hz Motor Generator and 415 Hz Frequency Converter models than any other manufacturer, plus a full range of paralleling, power distribution and control equipment required for total power system integration.

No wonder PILLER remains the NO. 1 CHOICE in power protection for IBM CPU's, with more than 3,000 systems installed coast-to-coast.

Like to know more? Contact Murray Lazar, Director of Marketing. (914) 355-6741.

CONTROL SYSTEMS, INC

Communications at NCC

Micom Systems, Inc.

Micom Systems, Inc. will introduce three new models of its Micro4000 modem series at the National Computer Conference in Booth M103.

The Model 4024 modem is a Bell Laboratories 201 and V.26-compatible 2,400 bit/sec unit for use on four-wire point-to-point or multipoint lines. Available in synchronous and asynchronous versions, it supports fallback operation at 1,200 bit/sec and costs $795.

The Model 4048/V27 is capable of transmitting over lines that previously would have been considered impossible for high-speed use, the firm said. The modem can be applied to two- or four-wire, full- or half-duplex operation, point-to-point or multipoint operation.

The Model 4048/V27 features fallback operation at 2,400 bit/sec and is suited for multidrop applications because of its rapid "training" time, which is 18 msec. The unit is priced at $1,750.

The third new modem is the Model 4096, a small 9,600 bit/sec, V.29-compatible modem. It features fallback operation at 7,200 or 4,800 bit/sec and is intended for point-to-point, full-duplex, four-wire operation. The unit is priced at $2,695.

The company is located at 220151 Nordhoff Ave., Chatsworth, Calif. 91311.

CAPTURE RETRO-GRAPHICS™ ON YOUR DEC™ TERMINAL.

Retro-Graphics terminal enhancements are PC boards that fit into ordinary display terminals and transform them into full-featured graphics terminals — with no loss of existing features and at a fraction of the cost of comparably equipped graphics terminals.

Thousands of users have either field-upgraded their DEC VT100® and VT132® terminals or have purchased them with Retro-Graphics enhancements fully installed and supported.

Now with DEC's newest additions, the VT101®, VT102® and VT131®, Digital Engineering has responded in kind with our newest generation of Retro-Graphics, available for the growing VT100 family.

VT100

VT101

VT102

VT131

Introducing GEN.II® For DEC. More Graphics Power And Convenience.

Our GEN.II Retro-Graphics products are designed to emulate both the Tektronix® 4027 and 4010 graphics terminals.

Because they are based on industry-standard Tektronix protocol, GEN.II products are both powerful and familiar to most programmers. Additionally, GEN.II's graphics intelligence is resident in the upgraded terminal, assuring rapid graphics generation because host-terminal data transmission is held to a minimum.

Graphics programming and operation are considerably eased by simple, English-like commands. For example, the following command string (either transmitted by the host or entered from the keyboard):

1 PIE, 100, 0, 300, 45

will cause the terminal to draw an eight-sided polygon with a radius of 100 and fill the interior with a shading pattern.

In addition to performing *area-fill* and *polygon-drawing*, a programmer can draw *arcs* and *vectors* and *define and shape text characters* with similar high-level command strings.

Software Compatibility Assures Your Long-Term Investment.

Since our GEN.II products for DEC emulate the 4027 and 4010, compatibility with utility and applications programs, whether now or in the future, is guaranteed. Currently, Retro-Graphics products are successfully being used with ISSCO's® DISSPLA® and TELLAGRAF®, Tektronix' PLOT 10®, Megatek's Template®, Precision Visuals' DI-3000®, Signal Technology's Interactive Laboratory System (ILS)®, and Digital Engineering's own PLOTPAK®.

Graphics I/O And Solid Backup Throughout.

Digital Engineering has built a solid foundation of support tools for GEN.II. For instance, an optional I/O connector allows the operator to use a light pen or to output to a variety of impact or non-impact printers. Professional documentation assists at every level of operation. A worldwide distribution network assures prompt delivery and backup. And whether you tap our service network or opt for on-site service — from one of the largest field service organizations in the world — your problems will be quickly resolved.

Two GEN.II's For The DEC Family.

GEN.II is offered in two models for the VT100, VT101, VT102, VT131 and VT132 terminals — one with green screen and 640 x 480 resolution, and another with white screen and 640 x 240 resolution.

Either way Digital Engineering's GEN.II Retro-Graphics enhancements will capture your imagination — and your graphics.

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DI-3000 is a trademark of Precision Visuals, Inc. ILS (Interactive Laboratory System) is a registered trademark of Signal Technology, Inc.
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See us at NCC (Booth 4316) and NCGA (Booth 630)

Racal-Milgo, Inc.

Racal-Milgo, Inc. will be showing its line of modems, statistical multiplexers, data encryption devices, terminals and network management systems at Booth 4010.

Included in the display will be the firm's Network Performance Facility, an enhancement to the vendor's Communications Management Series of diagnostic control systems.

The performance facility will permit up to 22 real-time measurements to be collected simultaneously for every line, control unit and device in a network, the vendor said. Its price begins at $41,000.

Racal-Milgo is located at 8600 N.W. 41st St., Miami, Fla. 33166.

Prentice Corp.

Prentice Corp. will be showing its line of modems at Booths 6019 and 6020.

The vendor's line includes acoustic, direct-connect, limited-distance and point-to-point modems.

Units cost from $190, the vendor said. The vendor is based at 266 Castian Drive, Sunnyvale, Calif. 94086.

Communications at NCC

Anderson Jacobson, Inc.

In Booth 4322, Anderson Jacobson, Inc. will be displaying an acoustic coupler/modem, ink jet printer, CRT terminal and matrix printer.

The originate-only Model AJ 1233 acoustic coupler/modem communicates with Bell Laboratories 212A, 103/113, VA 3400 and AJ 1256/1259 modems. It is said to be the first "triple" acoustic coupler to communicate with the Bell 212A devices. It is switch-selectable for communications at data rates of 1,200 bit/sec synchronously or asynchronously. It costs $995.

The Model AJ 650 ink jet printer uses a "drop on demand" method of applying ink to paper in a dot matrix. Character width and spacing are variable and can be switched from a standard 80 char./line to a compressed 132 char./line format with single or double spacing. It costs $3,400.

The Model AJ 520 132-col CRT terminal features a detached typewriter-like keyboard, 15-in. nonglare screen, brightness/contrast controls, screen tilt adjustment and six video attributes. It also offers 12 multistep user-programmable function keys. It costs $1,995. The Model AJ 862 matrix printer terminal offers bidirectional printing, nonvolatile memory and Ascii, APL and graphics character sets. It costs $2,800.

Anderson Jacobson is located at 521 Charcot Ave., San Jose, Calif. 95131.

Astrocom Corp.

Astrocom Corp. will be exhibiting its Metromodem here in Booths M221 through M223.

This product was designed to transmit synchronously with total reliability at speeds of 2,400 or 4,800 bit/sec, over distances up to 50 miles. It offers several operational displays, self-test and a number of analysis functions, including analog loopback, digital loopback and a control for placing the remote modem in digital loopback from the local Metromodem. According to the vendor, it is compatible with any combination of Western Electric Co. 3002 load wire pairs and the Texas Instruments, Inc. carrier network, found in most metropolitan areas. The Metromodem is priced at $1,075.

Also on display will be the company's double modem card, which reportedly enables a standard 16-card nest to accommodate up to 32 modems. This product costs $360, the vendor said from 120 W. Plato Blvd., St. Paul, Minn. 55107.

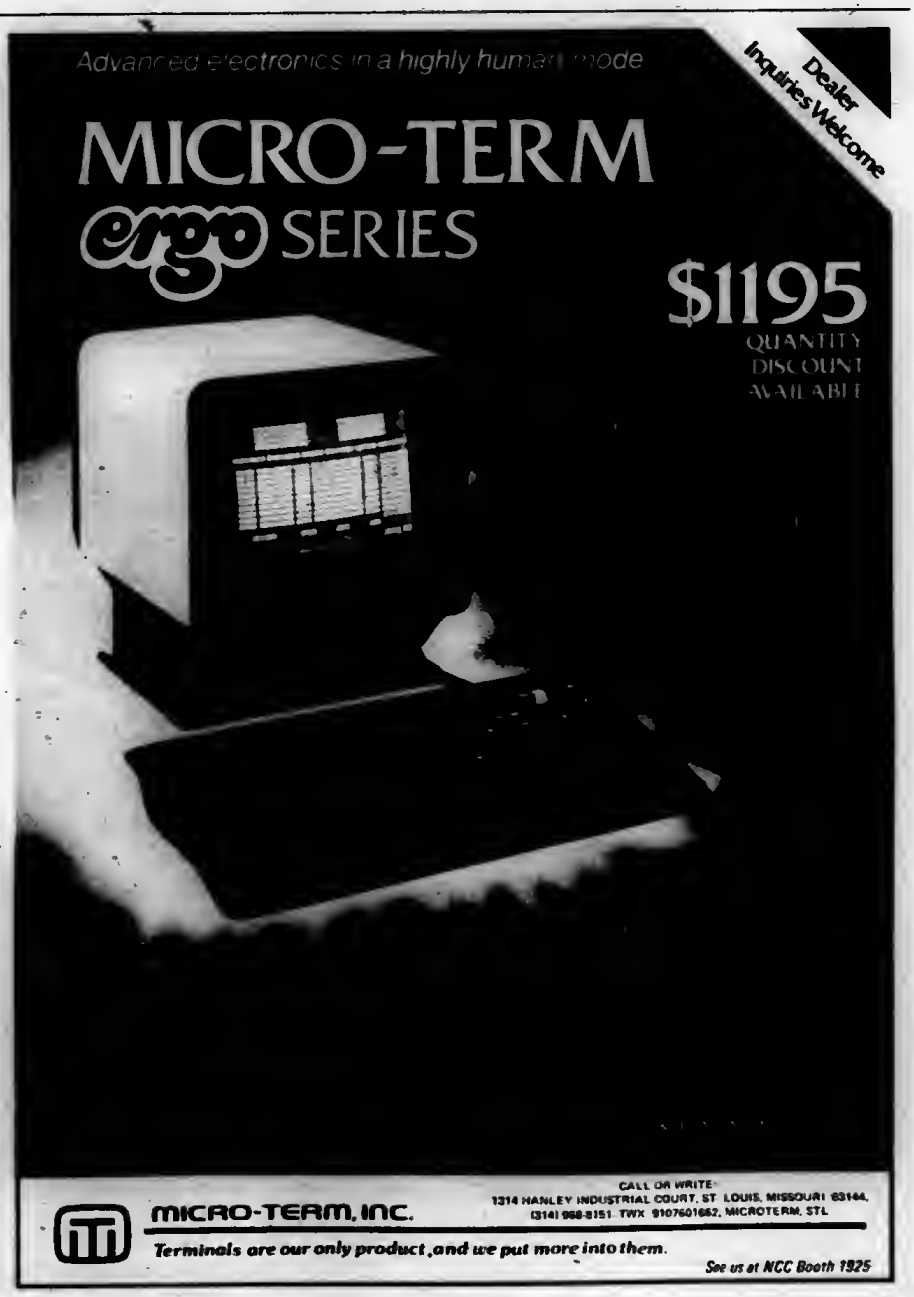
Lear Siegler, Inc.

Lear Siegler, Inc. will be at Booth 3500 displaying several products, including a new CRT terminal, an enhanced CRT terminal and graphics capabilities.

The Model ADM 22 CRT terminal is a new offering and features a nonglare, 12-in. monitor in green or white phosphor, with a 24 line by 80 char./line format. It provides dual intensity, reverse video, underline and blinking. It costs $695.

The enhanced ADM 24 CRT terminal features eight user-programmable function keys that are shiftable to 16 functions, with 64 char./function. It costs $1,095.

Lear Siegler is offering full graphics capabilities on its ADM 3A, ADM 5, ADM 31, ADM 32 and ADM 36 CRT terminals. The single-circuit graphics board gives the terminals full vector drawing capabilities to develop bar charts, pie diagrams, histograms and function plots. The board costs $1,050 from the vendor at 714 N. Brookhurst St., Anaheim, Calif. 92803.



Communications at NCC

Control Concepts

Control Concepts, a division of Presearch, Inc., will be showcasing its product line in Booths M224 and M226. On display will be the company's EM-3275 and EM-3276 — two plug-compatible alternatives for the remote stand-alone IBM 3275 and 3276 information display systems.

The EM-3275 and EM-3276 support all of the standard characteristics of the IBM single-terminal configuration plus provide additional editing functions for greater utility, Control Concepts claimed. They also feature Bell Systems 201C compatibility; 2,400 bit/sec communications; leased line or dial-up options; direct connect to RJ11C modular telephone jack; voice-data switch adapter for use with all phones; and a carrying handle for easy portability.

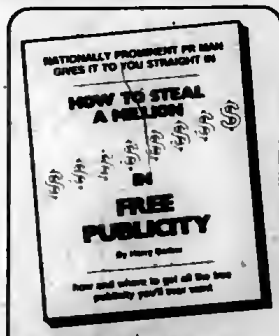
The two display stations cost $2,350 and $2,545, respectively.

Also on display will be Control Concepts' IC-3276-3 and IC-3276-4 Integrated Cluster Terminals. These emulate IBM's 3276 system with an integrated mini-cluster capable of supporting up to three additional separately addressable displays, each with an attached printer.

These items sell for $3,260 and $3,460.

The company will also be introducing the CC-3276 information display system that will handle Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) protocols. It has all of the features mentioned above, and previous Control Concepts terminals can be upgraded to this level, the vendor said. The 3276 is priced at $3,350.

Control Concepts' home base is at 2361 S. Jefferson Davis Highway, Arlington, Va. 22202.



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Interstate Electronics Corp.

In Booths 6923 through 6926, Interstate Electronics Corp. will show its terminals, boards and chips.

The VRT101 intelligent voice terminal is said to combine 99%-plus accuracy with a 100-word vocabulary, the CP/M operating system and a broad range of disk storage options.

The VRT101 costs $5,295, the vendor said.

The VRT200 system adds voice recognition to the Lear Siegler, Inc. ADM 3A and ADM 5 dumb terminals. These stand-alone terminals are total hardware/software systems that may be installed without modifying software.

The Model VRT200 costs $1,982 from Interstate Electronics, 707 E. Vermont Ave., P.O. Box 3117, Anaheim, Calif. 92803.

Kimtron Corp.

Kimtron Corp. will show a CRT terminal with expansion capabilities in Booth 2532.

The Model ABM 85 has a high-resolution nonglare screen in a tilting enclosure with a detachable keyboard. It provides room for at least one disk drive and at least two additional printed circuit boards, the vendor claimed.

The terminal has full video attributes, programmable function keys, 128 Ascii characters, business graphics, a 25th status line and advanced editing features, according to the vendor.

It costs $995 from Kimtron at 2255-H Martin Ave., Santa Clara, Calif. 95050.

Atlantic Research Corp.

Atlantic Research Corp. will be showing three models of its Interview family of data analyzers designed for field service, technical control and starter applications in Booth 4525:

- The Interview Model 29A is the most inexpensive of the three, costing $2,995 and featuring a hexadecimal keyboard.
- The Interview Model 30A has a code-converted Ascii keyboard and costs $3,200.
- The Interview Model 40A is the vendor's lowest cost fully interactive data analyzer at $3,750.

All three models are operationally compatible with the vendor's more powerful, engineering-oriented Models 3500/4500 series units, according to the vendor.

Each unit is said to display 512 characters of data and protocol sequences from an 8K-byte buffer.

Other features include a built-in library of tests, user-friendly menus and operator prompts and 9-bit (8-bit plus parity) asynchronous graphics terminal testing.

Atlantic Research is located at 5390 Cherokee Ave., Alexandria, Va. 22314.

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Communications at NCC

Multi-Tech Systems, Inc.

Multi-Tech Systems, Inc. will display several products, including the FM30 and FM31 acoustic couplers in Booth A662 at the National Computer Conference.

The FM30 transmits and receives asynchronous serial data at speeds up to 300 bit/sec, originate only, in half- or full-duplex mode over switched telephone networks. The FM31 transmits asynchronous serial data at speeds up to 300 bit/sec, originate or answer, in half- or full-duplex mode over switched telephone networks.

Both units are compatible with all Bell 102- and 113-type modems and interfaces with devices utilizing RS-232B/C or TTL current loop standards.

The FM30 is priced at $225 on a unit basis. The FM31 costs $265 in single units. Delivery is about two weeks.

The firm is also showing its MT212A and MT212D dual speed 300 and 1,200 bit/sec modems, which are compatible with Bell's 212A units. The modems provide full-duplex operation over dial-up lines in asynchronous or synchronous mode. They are available in stand-alone and rack-mounted configurations, providing originating and automatic answering capability.

The MT212A lists for $850, and the MT212D lists for $695.

Also on display will be the company's MT25 Breakout/Monitor. This is a portable diagnostic device allowing the individual access of the leads of the RS-232 interface and the patching and/or monitoring of these leads.

The unit is priced at $149, including carrying case and jumper wires.

The company will also show its MT500 desktop computer system that provides both data and word processing capabilities. This system features a video display, Zilog, Inc. Z80A microprocessor; CP/M operating sytems; 64K bytes of random-access memory; a single board CPU with built-in S-100 expansion; and two integral 5¼-in. disk drives with floppy disk storage capacity of up to 900K bytes and 5¼-in. Winchester storage capacity of 5M bytes. Options include a letter-quality or high-speed printer and modems.

The price of this system ranges from $4,795 to $7,995, depending on storage options. Dealer discounts are available. The firm is located at 82 Second Ave. S.E., New Brighton, Minn. 55112.

Ann Arbor Terminals, Inc.

Ann Arbor Terminals, Inc. will introduce at NCC '82 a high-end alphanumeric CRT terminal called the Guru, which implements the Ansii X3.64 standard. It is said to display from 18 to 60 lines and from 40 to 160 col using horizontal and vertical controls. It will be on display at Booths 2028 and 2029.

Editing features include insert and delete line or character, insertion replacement mode and a set of erasure commands. The terminals block and transmission capability allows an entire screen or selected portions of the display to be transmitted, the vendor said. Separate bit/sec rates for send and print are selectable and range from 110- to 19.2K bit/sec.

The Guru costs about $2,000 from the vendor at 6175 Jackson Road, Ann Arbor, Mich. 48103.

Universal Data, Inc.

On display for the first time, in Booth M255, will be a hand-held computer terminal from Universal Data, Inc.

The UDI 100 features a cursor-controlled LCD with two 16-char. display lines. The heart of the unit is an 8-bit parallel processor with 16K- to 128K bytes of numeric memory and 8K- to 64K bytes of alphanumeric memory.

UDI is located at 3960 Ortonville Road M-15, Clarkston, Mich. 48016.

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Communications at NCC

Ampex Corp.

Ampex Corp. will be showing in Booth 4004 a buffered editing CRT terminal, Multibus-compatible core memory module and a fixed-head disk drive.

The D81 buffered editing CRT terminal operates in either conversational or block mode. Its keyboard employs an IBM Selectric-like layout and is equipped with fast repeat-type keys that allow rapid data entry, the vendor claimed.

The CRT terminal has an RS-232C asynchronous interface that operates up to 19.2K bit/sec, half- or full-duplex. It also has a standard serial printer interface. The price is $1,249.

The Multibus compatible core memory module Model MCM-8086 was designed as a prime direct replacement or as an expansion memory for the Intel Corp. 8086 microprocessor. It has a capacity of 64K bytes and a data transfer capability of eight or 16 bits and costs $2,250.

All three versions of the Megastore fixed-head disk drive, the Models 11, 1223 and 4661, are available in a 7-in. chassis with up to 1M byte of storage.

Megastore in the 7-in. configuration is priced at $22,855 per megabyte for Digital Equipment Corp. PDP-11 applications, Ampex said from 401 Broadway, Redwood City, Calif. 94063.

Selanar Corp.

Selanar Corp. will introduce six graphics enhancements for a number of alphanumeric terminals, including the Digital Equipment Corp. VT100 series of terminals. The enhancements will be on display at Booths A341, A343 and A345.

The enhancements are said to be field-installable and allow the terminal to retain its original capabilities when the new commands are added. Prices for the six enhancements range from $600 to $1,595 from the vendor at 437-A Aldo Ave., Santa Clara, Calif. 95050.

Halcyon

Halcyon will exhibit a variety of its data communications test products in Booth 4032.

Those products include data monitors, data link monitors, data link analyzers, data recorders, line test generators, universal test systems, transmission test sets, transmission line monitors and wideband test sets, the vendor said.

Prices range from $1,895 to $10,995, according to the vendor.

Halcyon will also be showing a dual link network system consisting of an eight-channel master processor, slave processor and modems costing $13,040.

Halcyon is headquartered at 1 Halcyon Plaza, 2121 Zanker Road, San Jose, Calif. 95131.

M/A-COM DCC, Inc.

In Booth 1133, M/A-COM DCC, Inc. will be exhibiting its line of data communications multiplexers, which are now available with optional integral modems and designed to save telephone line costs.

The Model CM9100 statistical multiplexer has a base price of $1,800.

The Model SM9200 switching multiplexer, either with a 4,800 bit/sec or 9,600 bit/sec integral modem, has a base price of $2,200.

The Model EC9400 error controller, also with integral modems, has a base price of $995.

The Model LM9500 lightwave multiplexer was designed for transmission over a fiber-optic cable. Its base price is $3,300, M/A COM DCC said from 11717 Exploration Lane, Germantown, Md. 20874.

Termiflex Corp.

Termiflex Corp. will be showing several newly introduced hand-held control/display units at Booths 2001 and 2002.

The units employ a communications control concept that allows up to 60 units to share a single serial port. Representative hand-held control/display units from the firm's entire line will be part of the exhibit including the firm's recently announced mill-spec design, the vendor said.

The control units cost between $495 and $3,995 each, the vendor said from its home base at 18 Airport Road, Nashua, N.H. 03603.

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Cincinnati, OH	June 29	Milwaukee, WI	June 6	San Diego, CA	June 19
Cleveland, OH	June 8	Minneapolis, MN	June 24	San Jose, CA	June 2
Dallas, TX	June 24	Mobile, AL	June 3	South Bend, IN	June 15
Denver, CO	June 8	Montpelier, VT	July 30	Stamford, CT	June 1
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Communications at NCC

Codex Corp.

The newest member of Codex Corp.'s CDX-268 series of intelligent terminal systems will be shown in Booth 6105.

The system is capable of running applications written for either the CP/M or Unix operating systems. It fits between the high end of the personal computer offerings and the low end of minicomputer products and is said to provide users with an advanced personal/low-cost office computer system with full communications capabilities.

A single enclosure contains the operator's CRT screen and keyboard, multiple microprocessors, up to 128K bytes of memory, more than 1M byte of diskette storage and the interfaces to IBM host-compatible network communications. The CDX-268 series device costs approximately $5,000, Codex said from 20 Cabot Blvd., Mansfield, Mass. 02048.

Intertel, Inc.

Intertel, Inc. will show two of its data communications network management systems, the Intertel 90/10 and the Intertel 90/15 — part of the company's Series 90 network control and data base management system — at Booth SA235.

The 90/10 is said to feature a color graphics display, network monitoring, diagnostic and restoral features and incorporate network management features that provide management reports on vendor performance, maintenance, service and network trends.

An internal spare modem is included, according to the vendor, that can be switched into operation from the central site via the Intertel network control console to ensure against communication failure at crucial sites.

The baseline system is said to consist of a central processor with 256K bytes of high-speed random access memory, a 60M-byte Winchester disk drive, streaming tape drive, color terminal, a dedicated printer, 8-channel multiplexer, and dial-up diagnostic port for remote customer service. The software-based Intertel 90/15, which can be integrated with the Intertel 90/10, is said to add complete performance monitoring capabilities as well as measurement and analysis of network performance, the vendor said.

Cost of the Intertel 90/10 is $89,500. The base price for the 90/15 is $89,500, dependent on system configuration, plus $25,000 for software. The 90/15 will be available in the fall from Intertel, Inc., 6 Shattuck Road, Andover, Mass. 01810.

Digital Microsystems, Inc.

Digital Microsystems, Inc. will exhibit its Hi-Net local-area network in Booth A749.

The system is a distributed microprocessor-based master/slave polling scheme with RS-422 electrical specifications using twisted pair cable. The system is a packet-switched network utilizing synchronous data link control protocols.

The system can support up to 32 network stations, either 8-bit or 16-bit, along a single Hi-Net cable, the vendor said.

Each network station features a Z80A 64K-byte processor in a variety of configurations.

A typical five-station configuration is priced at about $19,500 without the printer. The hard disk master station is priced at $8,995. The 8-bit user station, with no CRT terminal, is $1,595. The 16-bit user station with no CRT is $2,995.

The Hi-Net operating software, which is CP/M-based, is $300 and the 500-ft cable plus connectors is $200.

The company will also show its recently introduced Fox DMS-3/F, a low-cost 30-lb. desktop computer, consisting of a processor, 9-in. CRT terminal, two 5¼-in. single or double density, double-sided floppy disk units, a network interface, four RS-232C serial ports and two bidirectional parallel ports with status lines. The price of the unit is $3,995, the vendor said.

Digital Microsystems is located at 1840 Embarcadero, Oakland, Calif. 94606.

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Communications at NCC

3Com Corp.

At the National Computer Conference, 3Com Corp. will be exhibiting the Q-bus, Unibus and Multibus Ethernet (ME) controllers and its enhanced Unet communications software Version 1.5 in Booth A609.

The Q-bus Ethernet controller Model 3C200 has 32K bytes of dual-ported random-access memory, which permits both the controller and ME host CPU to access the controller memory, the vendor said. It is reportedly plug-compatible with Digital Equipment Corp.'s Q-bus computers, including the LSI-11, LSI-11/23, PDP-11/03 and PDP-11/23 machines. It costs $1,750.

The Unibus controller Model 3C300 is compatible with PDP-11 Unibus machines including VAX. It sells for $2,400, according to the vendor.

The ME Model 3C400 reportedly connects Multibus computers to Ethernet. It consists of a single board that plugs into any Multibus and connects to an ME coaxial cable via a transceiver cable and Ethernet transceiver. It costs approximately $1,250, according to the vendor.

The Unet software permits the networking of small and large Unix-based computers, according to the vendor, and costs $5,000.

3Com is based at 1390 Shorebird Way, Mountain View, Calif. 94043.

Digital Engineering

Digital Engineering, Inc. will show its line of graphics terminal upgrades, including its newly announced Gen.II, at Booth 4316.

Gen.II features emulation of Tektronix, Inc. 4010 and 4027 graphics terminals. Other features include monochromatics, gray scale and color display formats, standard to medium resolution, 8- and 16-bit microprocessors and compatibility with most industry-standard graphics packages, the vendor spokesman said.

The graphics terminal upgrade costs between $1,000 and $1,800, according to the vendor, who is based at 630 Bercut Drive, Sacramento, Calif. 95814.

RCA Micro Products

RCA Microcomputer Products' recently introduced videotex terminal, which includes a built-in direct connect 300 bit/sec modem and can display on an ordinary television, will be on display at Booth 4735.

The VP-3501 also reportedly features color graphics.

The terminal is available for $399 from the vendor at Box 3200, Somerville, N.J. 08876.

Communications at NCC

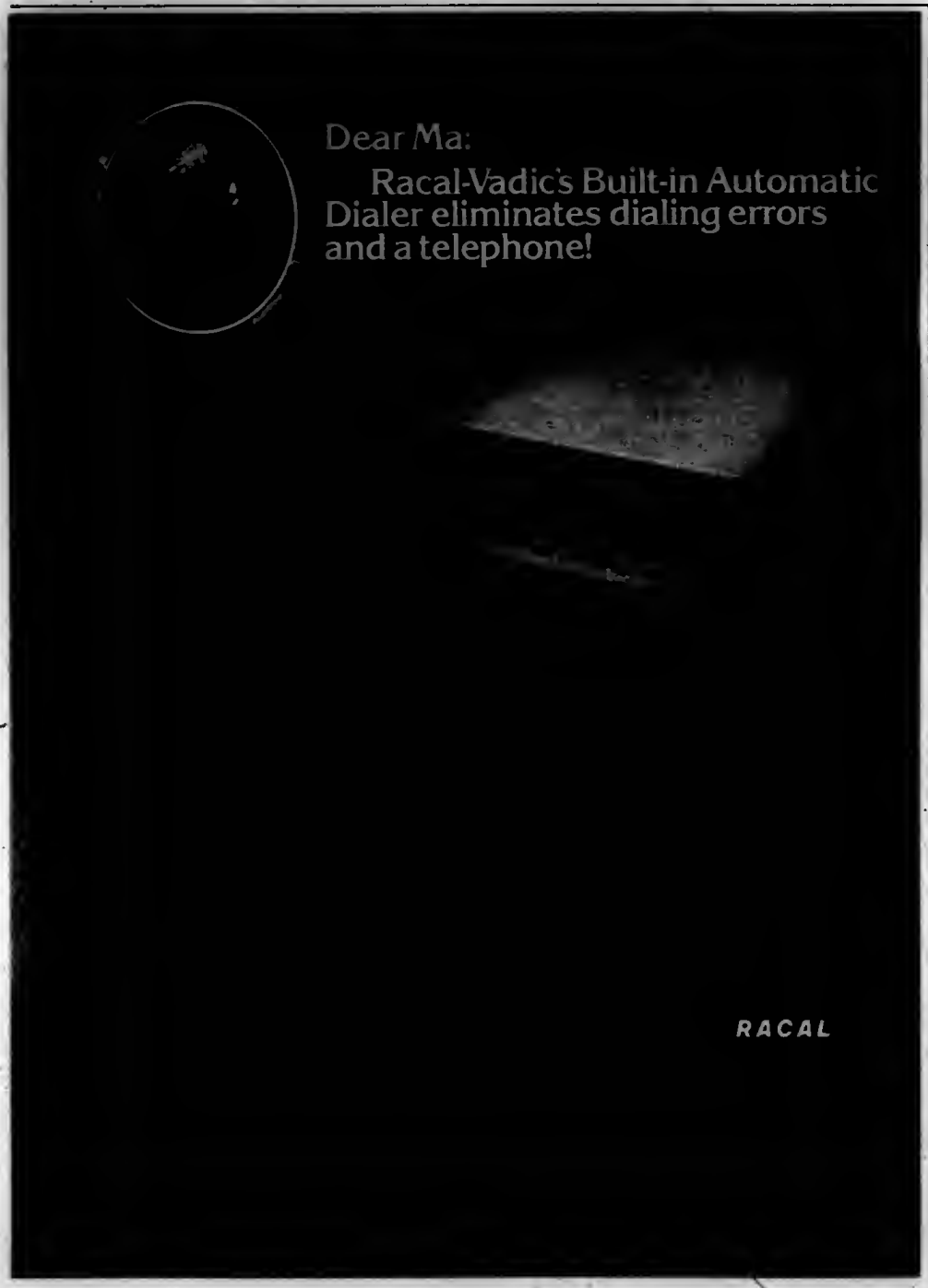
Alanthus Data Communications Corp.

Alanthus Data Communications Corp. will demonstrate its enhanced Model C-80 terminal controller/concentrator in Booth 5605.

The C-80 reportedly performs Ascii to IBM 3270 protocol conversion, enabling the user to substitute virtually any inexpensive Ascii terminal for 3270s. One C-80 will handle up to 25 Ascii terminals, giving the user dial-up access to 3270 applications from most remote locations and with full-screen editing.

Dual IBM host interface ports allow simultaneous access to two totally separate host mainframes or networks. In addition, the user can dial out to the public telephone networks and time-sharing and electronic mail services.

The basic C-80 supporting five Ascii serial devices and dual hosts costs $5,850 and rents for $270/mo, Alanthus said from 6011 Executive Blvd., Rockville, Md. 20852.



Visual Technology

Visual Technology, Inc., at Booth 1633, will be demonstrating its Visual 500 and 550 graphics terminals targeted toward laboratory, industrial, scientific and business markets.

Both terminals emulate the Tektronix, Inc. 4010 terminal. However, in an alphanumeric mode, the Model 500 provides emulation of Digital Equipment Corp.'s VT52, Data General Corp.'s D200, Hazeltine Corp.'s 1500 and Lear Siegler, Inc.'s ADM-3A terminals.

The Visual 500 costs $2,495 while the 550 — which provides full editing features and complies with Ansi X3.64 standards — costs $2,695.

The firm is based at 540 Main St., Tewksbury, Mass. 01876.

Wintek Corp.

Wintek Corp. will display its C-Net 6801 communications protocol at Booth 2020.

C-Net is said to provide for data acquisition, energy management, machine and process control at multiple remote sites.

C-Net is supplied with Wintek's 6801 Micro Control System (MCS) for use as a communications protocol and I/O device handler. C-Net allows up to 31 MCSs to be connected in a network to create a complete distributed control system with any central host computer with an RS-232 or current loop port, the vendor said.

C-Net is available with the 6801 for $119 with volume discounts available from Wintek, 1801 South St., Lafayette, Ind. 47904.

Communications at NCC

Informer Computer Terminals

Debuting in Booths 5448 and and 5449 will be Informer Computer Terminals, Inc.'s IBM 3274-51C- and 3276-2-compatible cluster controller and a terminal.

The 209 Cluster Controller includes a 25th status line, choice of green or white phosphor screen and interface capability with Ascii printers. The unit was designed to communicate with IBM communications processors via multipoint binary synchronous communications protocol through standard synchronous modems at speeds of up to 9,600 bit/sec. Its price will be announced at the National Computer Conference.

The D314 computer terminal is being offered at an introductory price of $1,995 until June 15. The firm can be reached through P.O. Box 91054, Los Angeles, Calif. 90009.

Digital Engineering

Digital Engineering, Inc. will introduce its line of terminal enhancement products for users who need to convert their present alphanumeric terminals to a full graphics capability and operate them without burdening the host computer, the vendor said. The enhancements will be on display at Booth 4316.

The GEN.II Retro-Graphics line is said to feature built-in intelligence on printed circuit boards that can be installed at the user location. The cost of Retro-Graphics is $1,150 from the vendor at 630 Bercut Drive, Sacramento, Calif. 95814.

General Datacomm

General Datacomm Industries, Inc. will show a 4,800 bit/sec private line, voiceband modem in Booth 4742.

The Datacom 4800 was designed to provide asynchronous or synchronous 4,800 bit/sec transmission over private lines, either half- or four-wire full-duplex, according to the vendor.

It costs $1,700 from the vendor at One Kennedy Ave., Danbury, Conn. 06810.

General Terminal Corp.

General Terminal Corp. will introduce its Model SW10, a terminal with 12 programmable function keys and eight transmission speeds up to 9,600 bit/sec, at Booth A419. Printer and communications interface is the RS-232C, and the display capacity is 80 char./line.

Other features include a high-contrast, low-glare green or white phosphor monitor, a movable keyboard and block mode transmission. The terminal has split screen management capabilities to divide the screen into two or three zones of variable length, the vendor said.

The SW10 is available for $995 from the vendor at 14831 Franklin Ave., Tustin, Calif. 92680.

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Communications at NCC

Digilog, Inc.

Digilog, Inc. will be showing a remote line monitor, network control console workstation, data line monitor and three diagnostic modems in Booths 5525 through 5527.

The Model RLM remote line monitor provides a troubleshooting facility on remote data communications lines from a central site. It is reportedly transparent to the existing system and can operate with any modem, multiplexer or protocol. It costs $2,800.

The Network Control Console is a desktop microcomputer with diskette storage that allows the vendor's Network Supervisory System to control local and remote sites from a single point. It provides an active interface to remote alarming, protocol monitoring and switching capabilities. It costs $5,500.

The Model DLM IV data line monitor performs X.25 frame and packet-level analysis. It costs $4,695.

The three diagnostic modems run at 4,800 bit/sec and cost $3,300 each, Digilog said from 1370 Walsh Road, Montgomeryville, Pa. 18936.

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Computer Transceiver Systems, Inc.

Computer Transceiver Systems, Inc. will display two keyboard printing terminals and a receive-only peripheral at Booth 3410.

The Execuport 430 keyboard printing terminal comes with RS-232 and current loop interfaces. For interface flexibility, the terminal's operational modes may be set from the keyboard. Such characteristics as transmission rate, data pacing, disconnect and 20-char. answer back may be chosen by this method. It costs $995.

The Execuport 440 is a keyboard teleprinter featuring an internal Bell Laboratories 103-style modem intended for direct connection to the telephone line via a modular jack. It also has all Execuport 430 terminal features. It is portable and suitable for time-sharing and other remote data inquiry applications, the vendor said. It costs $1,195.

The Execuport 420 receive-only peripheral is a receive-only printer, which reportedly can be used as a computer or CRT peripheral. It costs $795.

Computer Transceiver Systems can be reached through P.O. Box 15, E. 66 Midland Ave., Paramus, N.J. 07652.

Carroll Touch Technology Corp.

Carroll Touch Technology Corp. will exhibit in Booth M164 a touch system designed to interface with Digital Equipment Corp.'s VT100 terminals and provide 960 active touch points and extensive preprocessing of touch data.

The touch system is compatible with DEC's VT52 and VT100 modes, according to the vendor. The system attaches to the terminal via a standard terminal port connector and uses the same data line as the terminal.

The touch systems provide high-resolution industrial color monitors in both 13- and 19-in. sizes, the vendor said. The touch system is priced at $1,595 and is available from Carroll Touch Technology at 1212 Hagan St., Champaign, Ill. 61820.

Systems at NCC

NCR Corp.

NCR Corp. will be at Booth 1127 at the National Computer Conference to demonstrate its series of computer and office automation systems alongside a series of terminals offered by Applied Digital Data Systems, Inc., a subsidiary of the firm.

NCR's presentation will include a multimedia show overviewing its present product line and featuring the V-8565 II, a member of the V-8500 Group II computer family.

Unveiled in February, the V-8500 computers include seven models. The V-8565 boasts a 56-nsec CPU and offers up to 6M bytes of memory. It also offers four-way interleaving and has a virtual assist unit that reportedly boosts system performance. With 2M bytes of memory, the system costs $139,000.

NCR's Worksaver office automation systems are marketed through the firm's newly created Office Systems Division. The systems are user-friendly and offer creation, editing, printing and storage capabilities.

They range in price from $7,795 for a stand-alone unit to more than $100,000 for a clustered system.

Applied Digital's terminal exhibition will feature its Viewpoint/60 smart editing terminal. The buffered terminal features a detachable keyboard, a tilt mechanism, a CRT and eight programmed-function keys. The terminal has a -in. screen,. a spokesman said. It costs $895 from NCR at S. Patterson Blvd., Dayton, Ohio 45409.

Harris Corp.

Harris Corp. will be showing a variety of computers and peripherals at Booth 4000, including its top-of-the-line H800-1A and H800-1B processors, which reportedly can execute programs up to 6M bytes in size and support up to 128 concurrent users.

The H800-1A and 1B offer up to 12M bytes of real memory and 48M bytes of virtual memory. They were both designed for interactive program development, time-sharing, multistream batch, multiple remote job entry and real-time processing applications, a spokeswoman noted.

The systems also have 6K bytes of cache memory, an integral hardware floating-point processor and a 48-bit architecture featuring pipeline and parallel processing. Using the firm's recently introduced Virtual Operating System (VOS), the systems can process seven instructions at a time.

Typical H800-1A and 1B systems cost $192,400 and $199,600, respectively.

Harris will also be showing its H80-1A and H100-1A superminicomputers, which feature a CPU with an 18-bit program counter and the ability to run programs with up to 768K bytes of executable code per user, according to the spokeswoman. The computers support up to 32 interactive users and can be fitted with an optional floating-point processor.

They cost $44,950 and $55,000, respectively.

Finally, Harris will also be using its computers to demonstrate its Model 4760 general-purpose microprocessor-controlled electrostatic printer/plotter, priced at $12,500; its Model 5350 160M-byte Winchester disk drive, which costs $28,300; the $8,500 Harris Muse, word processing software for all of the firm's minicomputers; and Anvil-4000, a computer-aided design and manufacturing software package.

Anvil-4000 costs $115,000 for a full software package, or from $7,000 to $31,000 per specific applications modules. The package includes five modules, the spokeswoman explained.

Harris' Computer Systems Division is headquartered at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

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Systems at NCC

Microdata Corp.

Microdata Corp. will be at Booth 5006 during the National Computer Conference to demonstrate its Reality Series 8000 small business system, Sovereign distributed data processing (DDP) system, Wordmate word processing system and 32-bit Sequel processor.

The firm will also be demonstrating its Application Language Liberator (ALL) software generator, designed to reduce development, testing and debugging and eliminate the documentation of user programming, a spokesman claimed.

The 32-bit Sequel, the firm's high-end product offering, can store up to 2M bytes of memory and offers 1G byte of disk storage space. It reportedly has enough power to support up to 127 interactive terminals and has a number of internal independent processors that relieve the main procesor of I/O and local and remote diagnostics chores.

A typical Sequel system, the Model 3265, has more than 250K bytes of disk storage spapce, 1M byte of memory, four terminals and s 300 line/min printer and costs $163,275.

Microdata's Reality Series 8000 business systems offer up to 512K bytes of main memory, up to 514K bytes of disk storage and can support s maximum of 40 users. The system can incorporate a data base management system, communicate with local or remote terminals and uses the firm's English retrieval language, which reportedly allows direct access to the computer and its files without the need for complex programming.

The Series 8000 Model 8770, demonstrated at the show, includes 256K bytes of memory, 257.4K bytes of disk storage, two terminals and s 300 line/min printer and costs about $90,000.

Microdata's Sovereign DDP system is a multiprocessor device that features modular architecture, multifunctionality, high-speed data entry, user-programmed batch and transaction processing and interactive communications. The system connects to other systems via the firm's Dataway communications facility. It can also communicate with IBM computers vis s vsriety of IBM batch emulation software for IBM 2780, 3780, 2770, 3741 and Hasp workstations, the spokesman said.

The Sovereign system demonstrated at the conference — the Model 7920 — includes s file processor, an information processor, s keystation processor, a streaming tape drive and a 150 line/min printer and costs $83,790.

The Wordmate word processing system operates on Microdata's Reality or Sequel processors. The system includes the appropriate software and s terminal that can reportedly handle normal data entry operations and word processing applications.

The system, including software, letter-quality printer and word processig terminal costs $8,700.

Finally, the firm will be demonstrating its ALL software generator that reportedly allows users to develop business applications without the use of conventional programming languages or coding. The software is self-prompting and operates on the firm's 32-bit Sequel system

ALL costs $22,700.

Microdata is based at 17481 Red Hill Ave., Irvine, Calif. 92714.

Alpha Micro, Inc.

Alpha Micro, Inc. will introduce a line of Winchester-based, multiuser, multitasking time-sharing computers at Booth 5512, that utilize the firm's newly announced processor — the AM-100/L — which incorporates the Motorola, Inc. MC68000 chip.

The Alpha Micro desktop unit for one or two users supports a 5¼ in. Winchester disk. Larger systems use 8 in. and 14 in. Winchesters.

These systems can have up to 8M bytes of internal random-access memory and can support up to 64 terminals and printers. Central processing units can be linked together.

Prices for the systems vary based upon individual dealer price lists, the vendor said.

The company is located at 17881 Sky Park N., P.O. Box 18347, Irvine, Calif. 92713.

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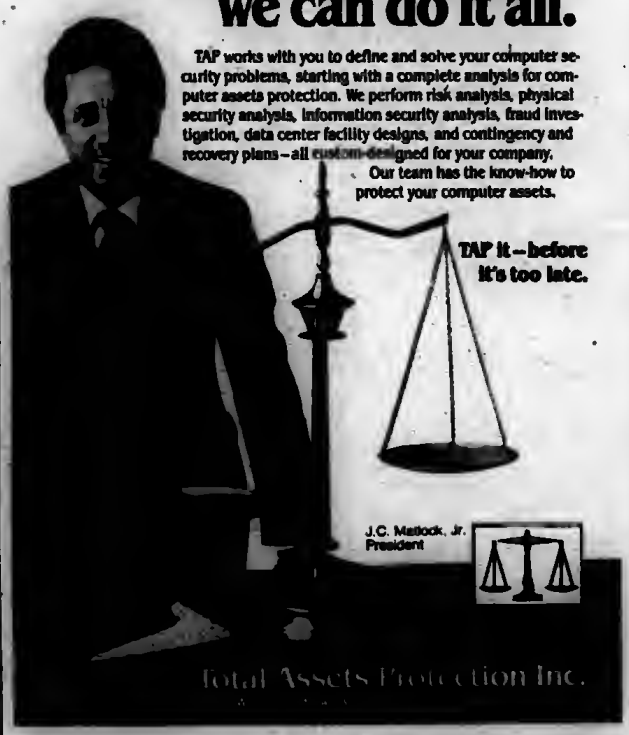

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Systems at NCC

Data General Corp.

In Booth 4508, Data General Corp. will be demonstrating how it has "engineered the anxiety out of computers" by exhibiting its integrated information management systems that combine office automation, electronic mail, decision support, word processing and data processing.

Systems displayed by DG will include its comprehensive electronic office and software, which is based on the firm's 16- and 32-bit computer systems. Also shown, reportedly for the first time, will be the firm's Eclipse S/20 and S/120 computers that incorporate DG's Microeclipse architecture, a spokesman said.

Other systems on display will be DG's microprocessor/advanced operating system, which runs on 16-bit Eclipse systems; a working model of an automated factory controlled by the firm's S/20 computer; and the MPT/100 technical desktop computer, which includes a 16-bit processor, minidiskette storage, keyboard and CRT terminal.

Software development and information management tools will also be on display, the spokesman noted.

As a promotion, DG will be holding a sweepstakes that offers a prize of a free trip to Aspen, Colo., and a year's supply of Guinness Stout. Conference attendees can automatically participate in the contest by entering their names and titles into one of four CRT terminals located in the DG booth.

Entry forms will also be mailed to 60,000 DP professionals throughout North America, the spokesman said.

DG's computer systems range in price from under $4,000 for systems like the OEM-targeted S/20 to several hundred thousand dollars for the firm's high-end 32-bit MV/8000 system.

The firm is based at 4400 Computer Drive, Westboro, Mass. 01580.

Victor Business Products

The Victor 9000 desktop business computer will be demonstrated by Victor Business Products in Booth 6614.

The Victor 9000 was introduced last fall and is based on the 16-bit Intel Corp. 8088 mircoprocessor. Priced at $4,995 in single-unit quantities, it reportedly features 128K bytes of main memory, expandable to 896K bytes; storage capacity of 1.2M bytes on two floppy diskettes; an 80/132 col. high-resolution display; a detachable keyboard; and three I/O ports.

Software includes Digital Research, Inc.'s CP/M and Microsoft, Inc.'s Mados operating systems and application packages for word processing, spreadsheet analysis, time management, general accounting, installment lending, pharmacy and a package for business equipment dealers.

The vendor is located at 3900 N. Rockwell St., Chicago, Ill. 60618.

Eagle Computer

At Booth 7123, Eagle Computer, Inc. will be showcasing for the first time its two recently announced 16-bit microcomputer systems — the BC-1610 and the BC-1630.

The micro systems incorporate an Intel Corp. 8086 microprocessor and accept all software created for the IBM Personal Computer.

The BC-1610 offers 128K bytes of random-access memory, two floppy disk drives with a total storage capacity of 1.6M bytes and can accept up to two terminals. The Model 1630 has 512K bytes of memory, integral floppy and hard disks with 10M bytes of storage and can support up to eight local or remote terminals, he said. The 1610 sells for under $5,000 while the 1630 is priced at $9,000.

Other products on display include the firm's Eagle I, II, III, IV and V eight-bit computers, priced from $3,995 to $9,995.

Eagle is based at 501 Vandell Way, Campbell, Calif. 95008.

Able Computer

Visitors to Able Computer, Inc.'s Booth 4042 will be shown three computer systems designed for OEM, field and office applications as well as a variety of communications, memory and bus products all compatible with Digital Equipment Corp. computer systems.

The three computers — the Magnum+ and 44 Magnum series — mark the firm's entry into the computer systems business, a spokesman for the firm said. The Magnum+ for office and communications systems costs about $44,000, the basic Magnum costs $27,000 and the industrial Magnum sells for about $30,000, a spokesman said.

The firm will also be showing its full line of data communications and memory products including its VAXDZ multiplexer and Unimap, which reportedly gives DEC's PDP-11/23 a full 4M bytes of memory plus RSTS/E, RSX or Unix operating systems compatibility.

Able's communications products range in price from $1,000 to $4,500; its cache and specialty memory products cost from $3,500 to $40,000; and its bus products cost from $825 to $3,600.

Able is located at 1732 Reynolds Ave., Irvine, Calif. 92714.

Perkin-Elmer Corp.

Perkin-Elmer Corp., in Booth 5004, will be exhibiting its 32-bit Megamini computer systems and software and demonstrating various applications on its Model 3254 system.

The firm's systems range from the low-end 3210 processor that is priced at $49,900 with 512K bytes of memory and a 27M-byte disk cartridge, to its high-end 3250 that costs $190,000 with 2M bytes of memory, a floating-point processor and 80M bytes of disk storage.

To demonstrate its computing capabilities, PE will be running geophysical and scientific applications on a fully expanded 32-bit system that includes a processor, two array processors and two magnetic tape units. A twin PE 3210 commercial system and a Model 3230 system running with Edition VII of Bell Laboratories' Unix operating system will also be demonstrated.

PE is headquartered at 2 Crescent Place, Oceanport, N.J. 07757.

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Systems at NCC

The Systems Group

The Systems Group will demonstrate its Business Express business application system, which is available on a turnkey basis with its System 2800 Zilog, Inc. Z80-based microcomputer system, at Booths A162 and A164.

Business Express reportedly includes a data base manager, a word processor and a multiuser operating system. Its software includes menus and user prompts and is said to incorporate features of both hierarchical and relational data base structures.

The Business Express software reportedly enhances the performance of the company's standard business computer, the System 2800, by supporting up to 10 simultaneous users without speed degradation. Business Express also includes error checking and recovery facilities, as well as automatic transactional data backup.

Business Express is priced between $12,000 and $18,000, depending on capabilities selected, the vendor said from 1601 Orangewood Ave., Orange, Calif. 92668.

NEC Information Systems, Inc.

NEC Information Systems, Inc. will show its microcomputers and peripherals at Booth 5008. On display will be the firm's Advanced Personal Computer, a 16-bit processor with up to 256K bytes of user memory, up to 2M bytes of floppy disk and both monochrome and color displays.

The system's cost begins at $3,300.

The firm is headquartered at Five Militia Drive, Lexington, Mass. 02173.

Fortune Systems

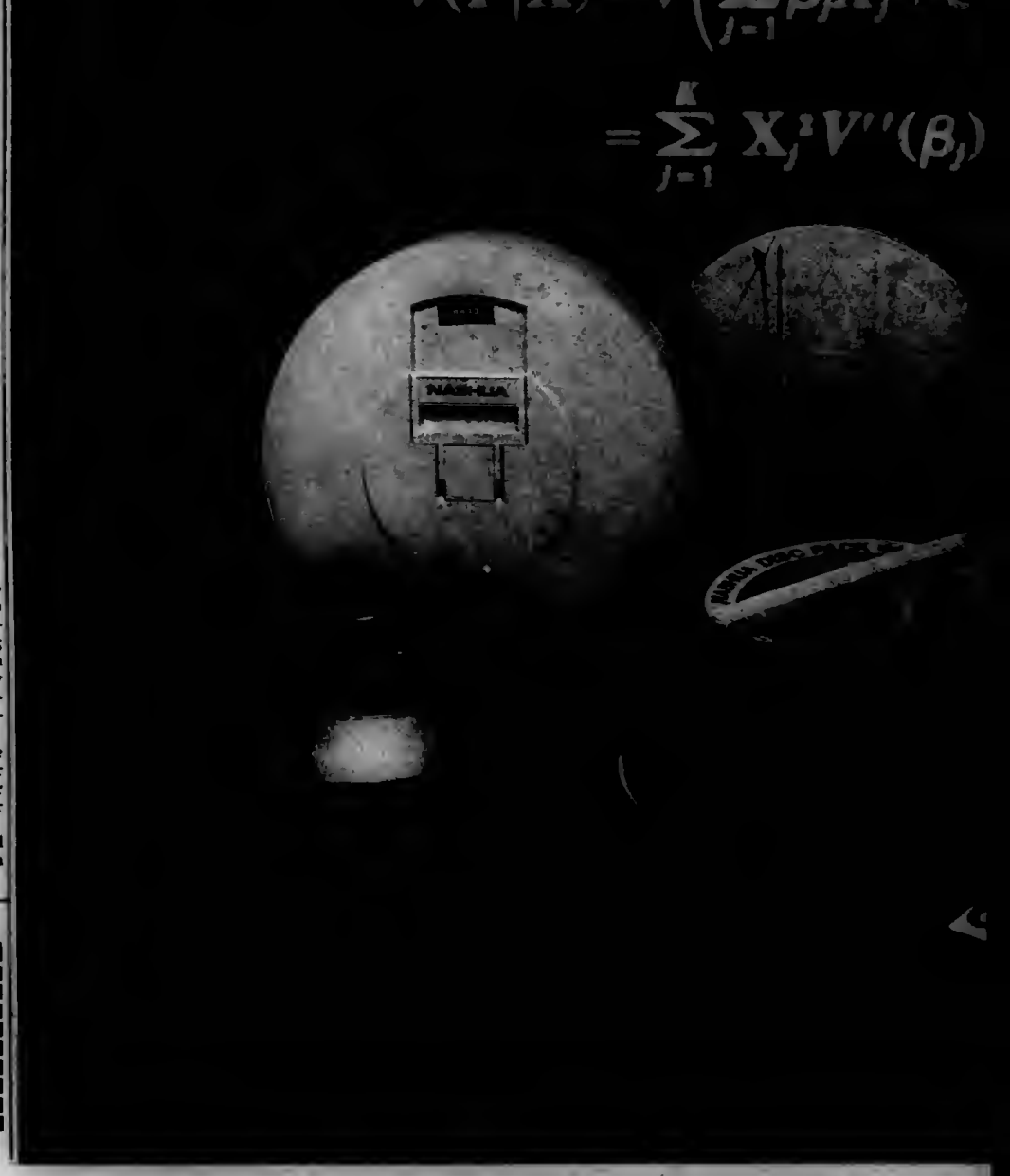
Fortune Systems Corp. will exhibit its 32:16 microcomputer system in Booth 2111.

The system incorporates the Motorola, Inc. MC68000 microprocessor and an enhanced version of Bell Laboratories' Unix operating system.

The company will also demonstrate For:Word, its Wang Laboratories, Inc.-compatible word processing system with Multiplan, a software tool that reportedly allows users to create financial models to develop business plans.

An entry-level Fortune 32:16 system retails for $4,995 and is available for Computerland and other stores.

Fortune Systems is located at 1501 Industrial Road, San Carlos, Calif. 94070.



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Systems at NCC

Intel Corp.

Intel Corp., at Booth 6610, will be demonstrating for the first time its portable Intel Personal Development System (IPDS), designed for programmers that develop applications for microcomputer-based systems.

The IPDS is geared to be used for 8-bit microprocessor applications and includes a CRT screen, keyboard and 5¼-in. 640K-byte flexible diskette — all in a 27-lb portable package. Additional disk drives can be added to the system to bring its total storage capacity up to more than 2.5M bytes.

The system incorporates an Intel 8085-based 64K-byte processor and can be optionally fitted with a second processor. The processors run under the firm's Isis microcomputer-development operating system or an enhancement of Digital Research, Inc.'s CP/M operating system. The CP/M, offered under an agreement with its vendor, is enhanced to run on a single disk drive rather than two floppy diskettes, the spokesman noted.

Marketed primarily as a development system, the IPDS can be used to develop applications based on Intel's 8-bit microprocessors and controllers. The dual-processor configuration and up to 256K bytes of optional bubble memory allow engineers to create programs on one processor and effect changes and debug their efforts on the duplicate CPU. Each processor shares a portion of the CRT's horizontally split screen display, but works in its own 64K-byte memory space, the spokesman noted.

As a personal computer, the system can use a variety of general-purpose software including word processing and spread-sheet financial forecasting packages.

The basic IPDS costs $4,495, not including the CP/M operating system and second processor. Intel is located at 3065 Bowers Ave., Santa Clara, Calif. 95051.

$$= V\left(\sum_{j=1}^{K}\beta_j X_j\right) + \sigma^2$$

$$+ \sum_{i=1}^{K}\sum_{j=1}^{K} X_i X_j \operatorname{cov}''(\beta_i, \beta_j) + \sigma^2$$

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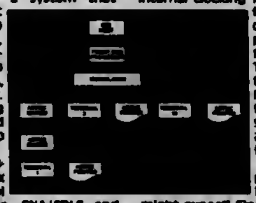

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NCC BOOTH M224

Systems at NCC

Zilog, Inc.

Zilog, Inc. will display its System 8000 line and an 8-bit Z80-based MCZ2/60 CP/M system at Booth 4025.

The System 8000 computers are multiuser 16-bit systems that incorporate the firm'a Z8001 microcomputers running under Zilog'a Enhanced Unix Version 7/System III System (Zeus) operating system.

The System 8000 uses Winchester disks in 32M-byte increments, 6,250 bit/in. start-stop cartridge tape backup, error checking and correcting main memory up to 4M byte/system and a 32-bit data bus.

The system can also use the firm'a Z-Net II networking sytsem, which includes an extended version of the U-Net software package developed by 3Com Corp. that permits other Bell Laboratories Unix-based systems to communicate with each other and with the System 800 computers using conventional lower speed data communications techniques.

The System 8000 is priced at $29,950 with discounts available. The Z-Net package is priced at $5,000.

Both products are available from Zilog, Inc., Campbell, Calif. 95008.

Nissei Sanyo America, Ltd.

Nissei Sanyo America, Ltd. (NSA), at Booth 1629, will be unveiling a variety of products, including a 16-bit microcomputer system, line printers, display monitors and rigid disk drives.

The 16-bit microcomputer — the KDS-7680 — is aimed at systems integrators and is based on an Intel Corp. 8086 CPU and accepts Multibus-compatibla peripherals. It operates under Digital Research, Inc.'s CP/M operating system and Intel's MS-DOS. Other products include:

- A 1,250 line/min band printer with a 64 character set, optical character recognition print quality and a 132-col format — priced at $10,400.
- A 300- and a 600 line/min dot matrix printer that generates compressed and enlarged character — pricing available during the National Computer Conference show.
- A 300 line/min band printer with a 64 character set and an 80-col format — pricing available at the show.
- A high-resolution page display monochrome monitor for word processing and graphics applications — priced at $325 in OEM quantities.
- An 8-in. rigid and 5¼-in. Winchester disk drives. The latter has a 10M-byte capacity and an average access time of 75 msec. Pricing on the drives will also be available during the show.

NSA can be reached at 40 Washington St., Wellesley Hills, Mass. 02181.

Altos Computer Systems, Inc.

Altos Computer Systems, Inc. will highlight its Series 5 family of multiuser microcomputers at Booth 1114. All of the systems incorporate micro-Winchester hard-disk technology.

Compatible with Digital Research, Inc.'a CP/M and MP/M and Phase One Systems, Inc.'s Oasis operating systems, tha two models feature a 4 MHz Zilog, Inc. Z80A CPU with 196K bytes of random-access memory; double-density, double-sided flexible disk drive; four serial RS-232C I/O ports; and a parallal I/O port.

The Series 5-15D with dual 1M-byte 5¼-in. flexible disk drive costs $2,990. The Series 5-5D with a 5M-byte 5¼-in. micro-Winchester drive backed up by a 1M-byte floppy drive costs $5,990 from the firm at 2360 Bering Drive, San Jose, Calif. 95131.

Molecular Computer Co.

Molecular Computer Co., a Calif.-based vendor of multiple-user microcomputers, will be showing its Supermicro 8 and Supermicro 32 systems at Booth 4325.

The systems were introduced last November as the Infinet I and II, but were renamed to more accurately reflect the product, a spokesman said.

The Supermicro 8 and 32 systems can support up to eight and 32 users, respectively, and are compatible with Digital Research, Inc.'a CP/M operating system. Both devices utilize the firm's Megabus interprocessor link to communicate with peripheral devices. The systems also allow each person using them a dedicated Zilog, Inc. Z80A microprocessor with 64K bytes of memory, 2K bytes of read-only memory and two RS-232C I/O ports — all included on a plug-in board. Users are added to the system by adding additional boards, a spokesman said.

Both the Supermicro 8 and 32 run under tha firm'a internally developed n/Star operating system, which is said to incorporate all of the standard features of CP/M software.

The basic single-user Supermicro 8 with a Z80A microprocessor, 64K bytes of memory, a 10M-byte Winchester disk drive and a 500K-byte 8-in. floppy disk drive costs $7,995. Tha basic Supermicro 32 with 32M bytes of 8-in. Winchester storage and a 20M-byte tape backup sells for $17,995. Each application processor costs $995.

Molecular Computer is located at 1841 Zanker Road, San Jose, Calif. 95117.

Systems at NCC

Commodore Business Machines

Commodore Business Machines, Inc., in Booth 6128, will unveil five advanced and entry-level microcomputer systems, as well as demonstrating other systems in its product line.

The advanced systems include:

- Commodore's BX series 16-bit multiprocessor computer system, which offers 256K bytes of random-access memory.
- The B series, which is a second generation of the firm's CBM system and has 128K bytes of memory, an attached display and integral disk units.
- The P series, an enhancement of the Commodore Pet that has 128K bytes of memory and can display 16 colors of text or graphics.

Prices for these systems will be announced during the show, a Commodore spokesman said.

The firm's new entry-level products include the Commodore 64, which has 64K bytes of memory, three-dimensional-style game graphics and music synthesis, costs $595 and the Ma Machine, a three-in-one home computer, game and music synthesizer, costs $179.95.

The firm's Vic-20, Pet, CBM and Superpet computers will also be shown and demonstrated at the show.

Commodore is based at The Meadows, 487 Devon Park Drive, Wayne, Pa. 19087.

Smoke Signal Broadcasting, Inc.

Smoke Signal Broadcasting, Inc. will be showing its Chieftain line of small business systems, along with peripherals and software for the Chieftain line, at Booths 2922 and 2923.

Peripherals on display will include the 95W4 and 98W15 Winchester disk drives, which are available in 4M- and 15M-byte configurations, the vendor said.

The drives run under Smoke Signal's OS-9, a multiuser, multitasking operating system that is compatible with Bell Laboratories's Unix operating system, according to a vendor spokesman.

The firm will also be announcing several applications packages for the Chieftain line including a Total Management/Marketing Planning package that includes a data base management system (TMMP/Manager) and a spread sheet column calculator program (TMMP/Calc), the vendor said.

Other planned announcements include a 20M-byte tape streamer option, OS-9 Level II, an operating system enhancement that offers support for up to 16 users and use of 1M byte of random-access memory, the vendor said.

The price of Chieftain systems begin at $200, the vendor spokesman said. Smoke Signal Broadcasting's corporate offices are located at 31336 Via Colinas, Westlake Village, Calif. 91362.

Eagle Computer, Inc.

Eagle Computer, Inc. will put its 16-bit microcomputer systems on display at Booth 7123.

The Model BC-1610 was designed as an individual system for applications requiring processing speed, substantial storage capacity and the availability of a library of software programming for business and other applications. Priced at $5,000, it offers 128K bytes of random-access memory (RAM) and two integral double-sided 5¼-in. floppy disk drives for a total 1.6M bytes of formatted storage.

The Model BC-1630 offers 512K bytes of RAM with integral floppy and hard disks that provide total formatted storage of 10M bytes. Asynchronous serial ports support up to eight local or remote terminals.

Priced at $9000, the BC-1630 is aimed at the user with a need for extensive internal memory, large storage capacity, access to a wide range of software and support for up to eight terminals.

Eagle is based at 983 University Ave., Los Gatos, Calif.

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Systems at NCC

Dataram Corp.

In Booth 4022, Dataram Corp. will introduce the M23 and W23, systems that are based on the Digital Equipment Corp. LSI-11/23 and incorporate Dataram's new Q-Map module for I/O mapping.

The Q-Map module allows up to 4M bytes of main memory addressing on the 22-bit LSI-11 bus, while providing an 18-bit bus to support existing peripheral controllers. The module emulates DEC's KT24 Unibus Map option used in the PDP-11/24. The W23 will run on operating systems such as RSTS, RSX-11-M, RSX-11-M-Plus and Unix, which supports the KT24 option.

The basic M23, using six of the 27 slots available, consists of the microcomputer, operator's console, Q-Map and 1M byte of main memory. Its single price quantity is $9,400.

The W23 has the same backplane as the M23 and provides an 80M-byte Winchester and associated controller.

The W23's basic configuration is $19,700 in single quantities, with an additional 1M-byte quad-board memory module priced at $3,400 each.

The company is located at Princeton Road, Cranbury, N.J. 08512.

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Plexus Computers, Inc.

Plexus Computers, Inc. will show its line of minicomputers, which run under Bell Laboratories' Unix operating system, at Booth 7532.

The firm will be showing a second member of its line, the P/25. The 16-bit desktop processor will support up to 16 users and is compatible with the firm's larger P/40, the vendor said.

The P/25 is available with 1M bytes of main memory and 72M bytes of disk storage, according to the vendor.

The systems cost between $19,900 and $47,500, the vendor said from its home base at 2230 Martin Ave., Santa Clara, Calif. 95050.

California Computer Group

California Computer Group, Inc. will demonstrate its Ultraminis, which are based on Digital Equipment Corp.'s LSI-11/23, PDP-11/44, PDP-11/70 and VAX-11/750 and Data General Corp.'s Nova, in Booth M142.

Also shown will be Ultrakit, comprising DEC- and DG-compatible controllers and peripherals for upgrading communications systems, disk and magnetic tape drives to Ultramini performance.

Ultradec systems are based on DEC LSI, PDP and VAX CPUs with 22-bit architectures and direct addressing capability of 1M bytes. LSI Ultra systems range from $9,995 to $19,995. The PDP Ultra system costs $49,500 and the VAX Ultra system is priced at $92,500.

The Ultranova system, based on a Nova-compatible CPU with 16-bit architecture, costs $14,500.

California Computer Group is located at Suite K-11, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

Sharp Electronics Corp.

Sharp Electronics Corp. will show its System 100 and System 200 small business systems and related peripherals at Booth 1622.

Peripherals on display will include the CE0331M 5¼-in. floppy disk drives, the CE-340 8-in. dual floppy disk drive and the CE-332P and CE-333P dot matrix printers.

A typical System 100 configuration costs $4,495, and a typical System 200 costs $6,525. Peripherals cost between $60 and $3,650, the vendor said.

Sharp Electronics is based at 10 Keystone Place, Paramus, N.J. 07652.

Systems at NCC

Data Tools International

Data Tools International, Inc. will introduce its M/8 multiuser computer system in Booth A561.

This product is an expandable set of processors with shared auxiliary storage and peripherals. According to the vendor, the M/8 system can handle up to eight users. It is packaged in a desktop or rack-mountable configuration and is recommended for system integrators involved in small to medium business or industrial environments where system growth and expandability are essential.

The operating system on the M/8 can execute CP/M programs without modification while employing a Unix-like directory structure to facilitate file access and modification. Each user on the system has access to at least one Zilog, Inc. Z80 with 64K bytes of random-access memory.

A fully configured eight-user system costs $12,000, the vendor said from 5470 N.W. Innisbrook Place, Portland, Ore. 97229.

General Robotics Corp.

General Robotics Corp. will display four new Digital Equipment Corp. LSI-11-based products in Booth 4542.

The Super Scorpio contains a 7.5M-byte 5¼-in. Winchester drive and controller software compatible with DEC's RK05. The software emulation provides three logical units, each formatted with 2.5M bytes of storage. A 5¼-in. floppy disk drive and controller provide 900K bytes of backup.

The system may be configured with a DEC LSI-11/2 and 64K bytes of random-access memory or an LSI-11/23 with up to 256K bytes of memory.

The system including all power supplies, modules and drives is priced starting at $6,325 in large OEM quantities.

The firm also introduced several hard disk controllers — a new product line. Controllers are for 5¼-, 8- and 14-in. Winchesters and storage-module-drive-type devices. Labeled the MWV11, the WNV11 and the SMV11, respectively, the controllers employ bit/slice microprocessor technology, which makes them easy to adapt to various different models of disk drives, the firm said.

The SMV11 is priced at $1,625 in OEM quantities, while the other two controllers are priced at $1,300, also in OEM quantities.

The company is located at 57 N. Main St., Hartford, Wis. 53027.

Megatek Corp.

Megatek Corp., in Booth 4012, will be showcasing its latest innovations in software and raster systems here.

On hand will be the Whizzard 7210 precision-stroke vector system; the Whizzard 7250 512 pixel color raster system; the Whizzard 7255 1024 pixel color raster system; the Whizzard 6245 monochrome 1024 raster terminal; the Whizzard Wand supporting software; and its template device-independent graphics software.

These products range in price from $18,000 to $50,000, the vendor said from 3985 Sorrento Valley Blvd., San Diego, Calif. 92121.

Dynabyte Business

Dynabyte Business Computers will be demonstrating its new line of 16-bit microprocessor-based business computers at Booth 7132.

The systems feature a multiprocessor design and integrate either an Intel Corp. Multibus or S-100 card cage for expansion. The systems are said to be able to process existing Digital Research, Inc. CP/M or MP/M 8-bit code — reportedly without modification — while supporting CP/M-86, MP/M-86, Data General Corp.'s Business Basic, Bell Laboratories' Unix and Phase One Systems, Inc.'s Oasis-16.

The systems support up to 16 users, up to 16 printers, up to 112M bytes of Winchester disk storage, an IBM-compatible 8-in. disk drive and a cartridge tape drive.

Prices for the systems begin at $6,995.

Dynabyte Business Computers is headquartered at 521 Cottonwood Drive, Milpitas, Calif. 95035.

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Office Systems at NCC

Grid Systems Corp.

Grid Systems Corp. will show its portable Compass desktop system in Booth A147.

The Compass has a pop-up screen, weighs 9¼ lbs and features software for program development and applications programs such as text editing and graphics, the vendor said.

Also available is an electronic spreadsheet, terminal emulators and a network of support computers at a remote location.

The system reportedly uses a single-user operating system with full multitasking capability and dynamic task management called Ccos.

A Bell Laboratories' Unix-like file system allows files to shrink and expand dynamically, according to the vendor.

The basic Compass costs $8,150 from Grid Systems at 2535 Garcia Ave., Mountain View, Calif. 94043.

Raytheon Data Systems Co.

Raytheon Data Systems Co. will be showing two of its word processing systems in Booth 1102.

The Models VT 201 (single diskette) and VT 202 (dual diskette) may be ordered with or without printer. Another feature is reportedly the upgradability of either system to any level of word processing product offered by the vendor.

Some of the options that may be included with the word processors include dual-sided disk drives, communications, a math package, shared printers, an alternate character set, a dual-tray sheet feeder with envelope feeder, a records management system and twin-track printer.

The Model VT 201 costs $7,505; the Model VT 202 costs $8,755, Raytheon said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Anadex, Inc.

A single-pass, letter-quality, dot matrix printer will be demonstrated by Anadex, Inc. in Booth 4335.

The Model WP-6000 operates in either of two modes: letter-quality at 150 char./sec or data processing at speeds up to 500 char./sec, according to the vendor.

The printer can change fonts electronically, the vendor claimed. Since character fonts are stored in read-only memory within it, special characters, Greek symbols and mathematical symbols may be called up under software control.

The device uses an 18-needle, dot matrix print head consisting of two vertical rows of nine needles whose centers are slightly offset from each other in the vertical dimension.

This allows up to 18 overlapping vertical dots to be printed in a single pass, so the resulting dots appear as a single straight line.

The Model WP-6000 costs $3,250 from Anadex, which is located at 9825 De Sota Ave., Chatsworth, Calif. 91311.

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Office Systems at NCC

Wang Laboratories, Inc.

Wang Laboratories, Inc. will be at Booth 4006 to demonstrate its enhanced Wangwriter word processing systems and Alliance office information systems. It will also be demonstrating its Digital Voice Exchange (DVX) telephone-based communications product.

The enhanced Wangwriter optionally features Digital Research, Inc.'s CP/M Release 2.2 operating system and added telecommunications capabilities such as 2780/3780 emulation and a teletypewriter. There is also a two-disk version of the original 96K-byte single-disk system and single- and double-disk versions of the firm's 128K-byte Wangwriter system. Advanced editing functions for the system include math, sort, merge and pagination. In addition, the system's document-handling capabilities have been extended from 15 to 75 pages of text, a spokesman said.

The 96K-byte Wangwriter costs $7,500 while the double-disk 128K-byte version is priced at $7,700. CP/M sells for a license fee of $200.

The Alliance 250 is a human-engineered office system designed to provide computing power to all levels of the office, the spokesman claimed. The Alliance product integrates word, data and audio processing with image processing and networking. It also provides visual memory, document and time management and a message system.

Alliance works on the firm's 5300 series workstations, Minidiskette Archiving Workstation and Proportional Space Workstation. The base price of the system is about $19,000.

Finally, the firm's DVX system uses the telephone to generate user voice messages as an alternative to telephone calls and memos. Messages are delivered to a user mailbox or directly to a telephone, the spokesman noted.

A basic DVX configuration costs $125,000.

Wang is based at One Industrial Ave., Lowell, Mass. 01851.

CPT Corp.

CPT Corp. will be showing two word processors in Booth 3106.

Both the CPT 8100 and CPT 6100 offer 128K bytes of memory. The CPT 8100 costs $10,990; the CPT 6100, $6,490.

Software to be demonstrated will include Shortcut, which gives the 8100 mathematical capabilities.

CPT is at 8100 Mitchell Road, Minneapolis, Minn. 55440.

Olivetti OPE

Olivetti OPE will be showing daisywheel printers, a dot matrix printer, a graphics thermal printer and flexible disk drives in Booth A637.

The Models DY 211, DY 311 and DY 821 daisywheel printers reportedly print at speeds ranging from 20 char./sec to 80 char./sec. They cost $1,745, $2,265 and $3,400, respectively.

The Model DM 5180 dot matrix printer can produce 16 by 32 matrix letter-quality print at speeds of up to 80 char./sec and draft-quality print at a speed of 180 char./sec, the vendor said. It costs $3,400.

The Model TH 240 graphics thermal printer is said to copy a full 24-line screen in under 6 sec, producing hard-copy alphanumerics and graphics at a rate of 240 line/min and interfacing with any standard serial or parallel port. It costs $800, the vendor said.

The Models FD 591 (single-sided) and FD 592 (double-sided) offer 96 track/in., unformatted capacities of 250/500K bytes and 500K bytes/1M byte, respectively.

They also offer an average access time of 80 msec and a mean time between failure of 10,000, the vendor claimed.

They cost $435 and $545, respectively, from the vendor at 505 White Plains Road, Tarrytown, N.Y. 10591.

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Peripherals at NCC

Digi-Data Corp.

At Booths A337 and A339, Digi-Data Corp. will be showing its new ½-in. streaming tape drive, which will be available later this year in a 100 in./sec version for 1,600 bit/in. tape systems. The drive will also be available in a 50 in./sec model for 3,200 bit/in. tape systems.

Digi-Data will also be exhibiting its Series 40 line of industry-compatible synchronous magnetic tape systems, complete with imbedded formatters and interfaces for Digital Equipment Corp.'s PDP-11 and LSI-11, Data General Corp. Nova and Eclipse systems and Hewlett-Packard Co. HP 2100/21MX processors.

Finally, the firm will be showing its Series 6400 cartridge tape transports, which feature a 6,400 bit/in. operation at 30 in./sec with a block-search capability at 90 in./sec.

The Series 40 tape systems range in price from $2,450 to $6,375 while the Series 6400 cartridge tape transport costs $1,390. Prices on the just-unveiled streaming tape drive will be released later this year, a spokesman said.

Digi-Data is based at 8580 Dorsey Run Road, Jessup, Md. 20794.

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Shugart Associates, Inc.

Booth 3512 will be the scene of Shugart Associates, Inc.'s display of its SA200 minifloppy disk drive.

The 5¼-in. drive offers 125K- or 250K bytes of unformatted capacity in single- or double-density, 48 track/in. and interface compatibility with industry standard SA400/450 and all dc motors, according to the vendor.

Single-unit price is $225 from the firm at 475 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Kennedy Co.

A cartridge transport from Kennedy Co. will be on display in Booth 1600.

Model 6455 combines streaming and start-stop technology, high-speed disk backup and normal file-management operations, the vendor said. In the streaming mode, this product reportedly stores or restores 20M bytes of data in less than 20 minutes. Data blocks are written on-the-fly along with 1.2-in. interrecord gaps.

In the start-stop mode, it reportedly permits consolidating files on non-adjacent disk sectors and tracks onto a cartridge using conventional data management techniques.

In single quantities the Model 6455 with embedded formatter is priced at $1,700. Kennedy is based at 1600 Shamrock Ave., Monrovia, Calif. 91016.

Data Magnetics Co.

Data Magnetics Co. will use Booths 1914 through 1916 as its forum to demonstrate three Winchester-technology magnetic recording heads.

The Winchester Monolithic Head, Wincheiter Composite Head and Micro-Composite Head are said to fill the need for head designs able to withstand repeated load/unload cycles without deteriorating the integrity of the recording element.

Prices range from $8 to $20/head, a spokeswoman said from 445 Laurelwood Road, Santa Clara, Calif. 95050.

Peripherals at NCC

Centronics Data Computer Corp.

Centronics Data Computer Corp. will introduce two printers and a print station series at Booth 4028.

The first printer is the Model 739 graphics printer, which features pin-addressable graphics with a resolution of 74 dot/in. horizontal and 72 dot/in. vertical. It has a print speed of 100 char./sec. For standard data processing tasks, it prints at 16.5 char./sec, the vendor said. It was designed for use with small business computers and costs $695.

A color-conversion kit for the Model 739, which reportedly will allow users to print in both black and red, will also be on display. The kit costs $75.

The second printer is the Model 122 graphics dot matrix printer. It prints at 120 char./sec and can produce trend analysis, pie charts and bar code graphics, according to the vendor. It costs $1,195.

The Printstation 350 Series is a series of matrix printers for data processing, word processing and business processing applications, the vendor said. Standard features on all models include paper-handling flexibility to accommodate cut-sheet and fanfold. Prices for the printstations start at $1,795 from Centronics Data Computer Corp., Hudson, N.H. 03051.

Bausch & Lomb, Inc.

The Instruments & Systems Division of Bausch & Lomb, Inc. will display four new plotters — two for its Hiplot/Regis series and two for its existing DMP series — at Booth 7100.

The DMP-4R is said to graphically reproduce an 8½- by 11-in. report in six colors and features 2.8 in./sec speed. The DMP-7R, with an eight-color capability, is available for 11- by 17-in. applications, the vendor said, and features a 2.5 in./sec speed.

A paper advance feature allows plot size on the DMP-8 and DMP-9 to vary from standard 11- by 17-in. to any smaller frame size, according to the vendor. Size variation is determined either by program control or manually by the user. The advance feature allows users to have unattended plotting regardless of desired plot size.

The DMP-8 operates by remote control while the DMP-9 is locally controlled via pushbutton. The user has the choice of single- or multipen plotting in eight colors.

The DMP-4R is priced at $2,380 and the DMP-7R at $3,180. The DMP-8 is priced at $2,580 and $2,780, respectively. The Instruments & Systems Division of Bausch & Lomb can be reached through P.O. Box 15720, Austin, Texas 78761.

Peripherals at NCC

Nashua Corp.

Nashua Corp.'s Computer Products Division will display its line of rigid and flexible magnetic media, including single disks, disk cartridges, packs and diskettes at the National Computer Conference in Booth 3409.

The firm is showing its disk cartridges, which are reportedly compatible with Control Data Corp.'s new LMD disk drive.

The company is located at 44 Franklin St., Nashua, N.H. 03061.

Qume Corp.

Qume Corp. will introduce additions to its Sprint family of daisywheel printers and terminals, as well as floppy disks in Booth 7119.

Among its new products will be the Sprint 11 family of printers, including a 35 char./sec, RS-232 interface daisywheel, for $1,776.

The company is located at 2350 Qume Drive, San Jose, Calif. 95131.

California Computer Products, Inc.

A series of intelligent raster displays and an 11-in. square digitizer will head the list of products to be shown in Booth 6605 by California Computer Products, Inc. (Calcomp).

The Vistagraphic 4000 family is a line of upward-compatible color and monochrome raster displays that reportedly can be configured as standalone graphics computers or intelligent terminals in a distributed graphics processing network. The series includes three models, ranging in price from $11,000 to $40,000.

The Series 2000 digitizer has a resolution of 200 line/in. and an accuracy of .025 in. It has three modes of operation — point, track and run — and features electromagnetic technology for more precise data input, a spokesman said. The digitizers range in price from $2,690 to $8,300.

Other systems on display will include the firm's electrostatic and pen plotters and plotter/printers that are priced from about $17,000 to $40,000.

Calcomp is headquartered at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Facit, Inc.

Facit, Inc. will exhibit a number of its printers, terminals and other data products and furniture in Booth 7500.

Among the printers to be shown will be the 4525 and 4526, which reportedly print bidirectionally at 150 char./sec, with up to five copies. A tractor mechanism feeds the paper either from the bottom or front.

The two models offer a choice between uppercase and lowercase characters, parallel or serial interfaces and either 80- or 132-col formats. The 4525 costs $1,595 and the 4526 costs $1,697 from the firm at 66 Field Point Road, Greenwich, Conn. 06830.

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Peripherals at NCC

Qantex Division of North Atlantic Industries

Qantex Division of North Atlantic Industries, Inc. will display several new products — including a quad-mode impact printer, a Winchester backup system and a communications tape terminal — at Booth 4516.

The 7030 printer is said to be fully compatible with Digital Equipment Corp.'s X-on/X-off protocol, with feature selection accomplished by use of escape codes. The 7030 provides 180 char./sec draft copy, 150 char./sec composed copy, 75 char./sec of near letter quality and 40 char./sec letter-quality printing.

The Model 150 Winchester backup system for S-100 based systems features serpentine recording and 17.2M bytes of storage on one data cartridge, according to the vendor.

The Model 1000 Communications Tape Terminal, which is available in a one- or two-drive versions, will also be displayed, the vendor said.

The Model 200 Mini Drive subcompact device using a DC100A cartridge with 1.3M bytes of storage will also be shown along with the Model 2200 and 2710 storage systems. The Models 650 and 400, using a DC300A cartridge with up to 17.2M bytes of storage, will also be shown. The models interface to DEC's PDP-11 and LSI-11, Data General Corp.'s Nova and Rolm Corp. and RS-232 systems.

The Model 7030 printer is priced at $1,995, the Model 150 Winchester at $2,995, Model 200 costs $385, Model 650 at $1,231, Model 400 at $2,385, Model 2200 at $2,310 and Model 2710 at $3,339 from the vendor at 60 Plant Ave., Hauppauge, N.Y. 11787.

Telex Computer Products, Inc.

Telex Computer Products, Inc. will spotlight magnetic tape subsystems featuring a new drive with an integrated controller at Booths 2013 and 2014.

Besides showing the recently announced IBM 3420-compatible tape subsystem, Telex will display its new Model 8020-2X, which houses two drives with an internal controller for a reported space reduction of up to 50% over long column drives.

The OEM Products Group will exhibit its 6200 series of 19-in. rack-mountable tape drives for the minicomputer marketplace. The series features 6,250 bit/in. density and 125 in./sec tape speed, according to the vendor.

The 8020-2X costs $57,600 for two 6,250 bit/in. drives and an integrated controller. Additional 6,250-bit/in. drive models are $18,900 each. The 6200 tape drive and formatter cost $9,825 and $7,945, respectively, from the firm at 6422 E. 41st St., Tulsa, Okla. 74135.

Charles River Data Systems

Charles River Data Systems, Inc. (CRDS), will be showing its Digital Equipment Corp. LSI-11-compatible Winchester disk system, which reportedly features a removable cartridge drive for on-line storage and backup, at the National Computer Conference.

The RLX3010 drive is said to incorporate both an 8-in. fixed Winchester with a 32.2M-byte capacity, plus an 8-in. removable cartridge Winchester with a 10.4M-byte storage capacity. The drive's total capacity is equal to four DEC RL02 drives, according to the vendor.

The device is software-compatible with LSI-11/23 technology and can run DEC's RSX-11M and RT-11 operating systems without modification, the vendor said.

The drive costs $9,800 in OEM quantities from CRDS at 4 Tech Circle, Natick, Mass. 01760.

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Peripherals at NCC

Quadrum Corp.

Quadrum Corp. will introduce a universal controller/buffer featuring 128K bytes of data and printer sharing at Booths A737 and A739. The Interfazer is an intelligent peripheral designed to provide e productivity solution when use of the computer is interrupted while waiting for the printer to complete a task or where several CPUs need to share a printer.

The device can accept the printer output of between one to eight computers through either RS-232C or parallel I/O cards. Interfazer will then buffer the data and steer it to the designated printer or other device without switching. The output device can be parallel or serial and the computer transmission rate does not need to match the output transmission rate, the firm said.

The unit is controlled with an Intel Corp. 8085 microprocessor and contains 10 slots for I/O cards or memory expansion.

Prices begin et $350 for the base unit, $350 for each 64K bytes of memory, $85 for parallel input cards and $95 for serial input cards from the firm at 4357 Park Drive, Norcross, Ga. 30093.

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Datasouth Computer Corp.

Datasouth Computer Corp. will display a dot matrix serial printer at Booth A728 that interfaces with RS-232C- and Centronics Data Computer Corp.-compatible equipment.

The Model DS180 can print 180 char./sec and has a bidirectional logic-seeking carriage. Under microprocessor control, the printhead takes the optimum path automatically to the next printable character.

The DS180 printer can produce 132 col lines at 10 char./in., with selectable expanded characters at 5 char./in. Standard features include: top of form, horizontal and vertical tabs, perforation skip-over, auto-line feed, self-test, adjustable forms tractors, cartridge ribbon and transmission rates from 110- to 9,600, the vendor said.

Printer parameters are programmable by the user from an integral key pad or via the data stream. A special nonvolatile memory retains these settings even when power is switched off, the vendor added.

Unit price for the printer is $1,595. The printer will be sold through e network of distributors, according to Datasouth Computer, located at 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

Teac Corp. Of America

Teac Corp. of America will show its line of floppy and cartridge disk drives and controllers at Booth 5509.

The firm makes disk drives for the minicomputer/microcomputer market. It also manufactures cassette tape transports, according to e vendor spokesman.

Prices range from $298 for the firm's FD-50A 5¼-in. floppy drive to $1,395 for the MT-20 formatted 20¼-in. cartridge tape drive.

The vendor can be reached at 7733 Telegraph Road, Montebello, Calif. 90640.

GNT Automatic

GNT Automatic, Inc. will be showing its 4604 tape reader/punch station at Booth 2003.

The 4604 can read and punch simultaneously or independently. It features a microprocessor-controlled interface with buffer memory that allows conversion of codes received from Ascii to EIA or EIA to Ascii. The punch unit can operate at 75 char./sec and uses all types of Mylar paper tape. The reader features a carriage return delay and is able to read up to 120 char./sec, the vendor said.

The unit costs $3,645, the vendor said from its home base et 1560 Trapelo Road, Waltham, Mass. 02154.

Peripherals at NCC

Xylogics, Inc.

Xylogics, Inc. will display the capabilities of its 650 Emulating Peripheral Processor and enhanced versions of two of its peripheral subsystem packages at Booth 4052.

The 650 is a controller that now has the capability to emulate Digital Equipment Corp. RK06/RK07 subsystems using standard DEC operating system drivers, the vendor said. Expandable up to eight drives, the 650 reportedly features a mixed drive capacity and adaptive direct memory access functionality. The unit also performs error correction code generation and detection and provides users with a three-sector buffer.

The XL2400 is an enhanced version of the company's XL2300 peripheral subsystem package for the DEC LSI-11/23 and is said to provide 22-bit addressing capable of supporting up to 4M bytes of random-access memory. The XL2400 is compatible with DEC's hardware and software and offers two serial RS-232 ports, diagnostics on tape cartridge and a built-in standard Q-bus backplane to connect the processor, memory and all device controllers, the vendor said.

The XL2000 is a peripheral subsystem package designed for the systems integrator who wishes to supply his one LSI-11 processor, the vendor said. It comes with a 20.8M-byte disk and a 17M-byte tape subsystem. Also included is a four by eight Q-bus backplane with power sequence and termination.

The 650 costs $4,500, the XL2400 costs $15,700 and the XL2000 costs $9,350. All are available from the vendor at 144 Middlesex Tnpk., Burlington, Mass. 01803.

Western Electronics

Western Electronics Technology, Inc. will be showing a dynamic multiple-access device (Dmad) designed to aid disk system contention and reconfiguration problems in large computer systems — including multiple mainframe arrangements — at Booth A457.

The Dmad moves subsystem contention from the controller level to the device level by providing additional control and data paths between the controller and disk storage units, a spokesman said.

The device is hardware and software transparent to the host system, and can be separated from the host computer by up to 1,000 ft of cabling, the spokesman noted.

The Dmad permits up to four peripheral controllers to be attached to each peripheral device access. The unit reportedly provides the requesting controller with an immediate response to a read/write request.

At the moment, the Dmad is designed to interface with up to four Control Data Corp. Model 7155 controllers and a Model 885 disk storage unit. It costs $15,600 from the firm headquartered at Suite J-103, 11281 Richmond Ave., Houston, Texas 77082.

DP-Tek, Inc.

DP-Tek, Inc. has announced six serial- and parallel dot matrix printers for users of Datapoint Corp. processors.

Called the Sysprint series, Models 8402, 8403 and 8404 accommodate serial RS-232C data signals and Models 8412, 8413 and 8414 accept Datapoint parallel data signals, a vendor spokesman said.

The printers feature printing speeds between 120- and 200 char./sec and bidirectional short line seeking operation. The RS-232C versions cost between $995 and $1,850, depending on size and paper width. The Datapoint parallel versions cost between $1,190 and $2,050, according to the vendor.

DP-Tek can be reached at P.O. Box 2411, Wichita, Kan. 67201.

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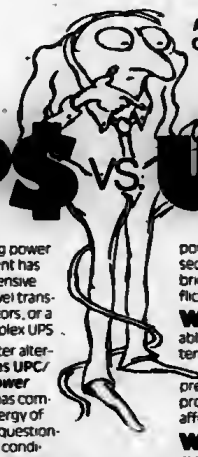

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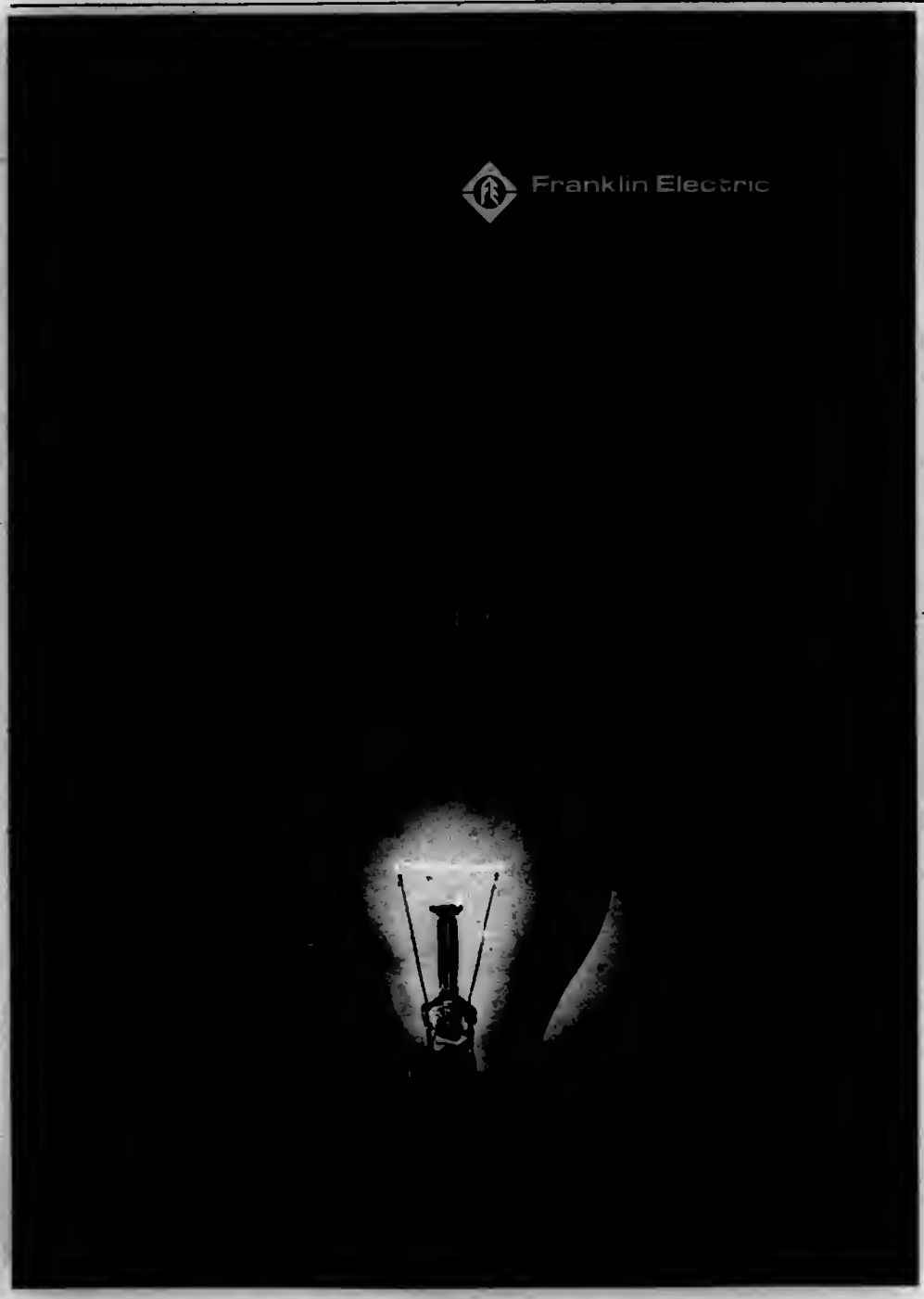
Peripherals at NCC

Harris Corp.

Harris Corp. will introduce a high-speed, tridensity magnetic tape drive reportedly featuring a speed of 125 in./sec and densities of 800-, 1,600- and 6,250 bit/in. at Booth 4000. The Harris Model 6730 is said to be compatible with the vendor's family of VOS superminicomputers.

It controls functional and diagnostic modes through a built-in microsequencer.

The Model 6730 is available for $52,000 from Harris Corp., 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.



True Data Corp.

True Data Corp. will show its new line of Micro Mark readers in Booth M140.

The Micro Mark I is a hand-fed reader and the Micro Mark II is an automatic-feed unit. The units reportedly allow users to read marks made with a No. 2 pencil, preprinted marks or punched holes on tab cards of standard dimensions.

As an educational tool, the readers can also be used by students learning computer programming. Program editing and debugging can be accomplished by going through the sequence of cards while looking for errors, the firm said.

The standard column spacing is .087 in., but to facilitate hand-marked entry, the columns can be spaced on .174-in. or greater centers.

The Micro Mark I is priced at $900 and the Micro Mark II is $1,500.

The company is located at 17092 Pullman St., Irvine, Calif. 92714.

Martec

Martec, a subsidiary of a Japanese trading firm, will demonstrate its line of peripheral products — which include a minifloppy, microfloppy, a streaming tape drive, Winchester drive and CRT monitors — at Booth A613.

In addition, the firm will show a Digital Research, Inc. CP/M-based business system that can handle one-to-eight terminals and up to 40M bytes of Winchester storage.

Among the products on exhibit will be the TEC FB-500 series of 5-in. minifloppy disk drives. Applications for these products, according to the vendor, are personal computers, word processors, point-of-sale terminals, small business computers and terminal equipment.

These minifloppy disk drives reportedly enable two units to be accommodated in a usual one-unit space because of the height reduced to half of conventional models. Adoption of a ceramic head, small stepping motor and direct-drive motor developed by TEC is said to permit high accuracy and reliability. They are available for between $120 and $160 each.

The vendor is located at 20 William St., Wellesley, Mass. 02181.

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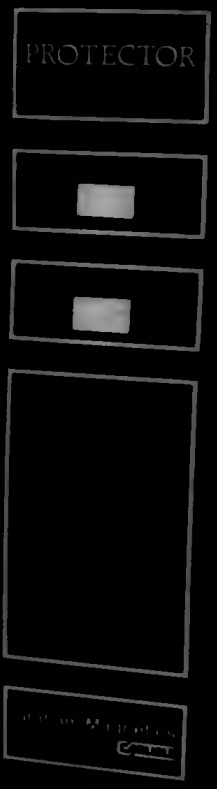

Peripherals at NCC

Miniscribe Corp.

Miniscribe Corp. will introduce several 5¼-in. Winchester disk drives at Booths A110 and A112 at the National Computer Conference.

Available in single- or double-disk configurations, the Miniscribe II Models 2006 and 2012 will offer 6.4M bytes and 12.8M bytes, respectively, of unformatted storage. These units are priced at $650 and $825, respectively, according to the vendor spokesman.

The Model 2012 features 85msec average access time and will also be fully software and hardware compatible with the Seagate Technology, Inc. ST412, according to the spokesman.

Single Disk Units

In addition, the company will announce its Miniscribe III series of single disk units. Storage size for these units are 6.4M bytes or 10M bytes, the vendor spokesman said. These units will be priced 10% less than the Miniscribe II units detailed above.

The Miniscribe IV series is available as a single-disk unit with 10M bytes of storage or as a double-disk unit with 20M bytes of storage. These disks are priced 15% higher than the Miniscribe II units, but offer 50% greater storage capacity, the firm said.

The units are sold in OEM quantities only. Prices indicated above are for 1,000 unit orders. Evaluation units will be available during the fourth quarter, with production commencing in the fourth quarter, the company said.

The company is located at 410 S. Sunset, Longmont, Colo. 80501.

Applied Data Communications, Inc.

In Booths 7917 and 7918, Applied Data Communications, Inc. will be showing a media conversion system and a floppy diskette initialize and copy system.

The Trans/Media 500 media conversion system was designed with the capability to be used with a direct-entry or a front-end system. It has disk-to-disk and RS-232 compatibility with a variety of systems. Nine-track tape may be used for entry, output or archiving data.

The basic system costs $12,800.

The IC-450 floppy diskette initialize and copy system is said to eliminate duplication problems. It is composed of a CRT terminal, workstation desk and 65K bytes of random-access memory. The basic model costs $13,900, Applied Data Communications said from 14272 Chambers Road, Tustin, Calif. 92680.

General Electric Co.

General Electric Co. will introduce a family of six serial matrix printers offering data and word processing and graphics modes of operation at Booth 1614.

The microprocessor-based 3000 series performs DP tasks at speeds up to 600 char./sec. For word processing applications, two models offer a high-resolution print mode at 120- to 198 char./sec. All models employ a logic-seeking printhead to bidirectionally print up to six copies.

Standard features include a 512-char. buffer, nonvolatile memory and a self-test and diagnostic capability. Prices range from $1,500 to $3,000, from GE's Data Communication Products Department, Waynesboro, Va. 22980.

Syncom, Inc.

Syncom, Inc. will exhibit its peripheral products in Booth 5510. The products to be shown include tape units of varying capacities, 8-in. and 5¼-in. flexible disks, formatted and unformatted, digital cassettes, magnetic cards, ¼-in. data cartridges, disk cartridges, front and top loading, disk packs and data modules.

The firm is located at 1000 Syncom Drive, P.O. Box 130, Mitchell, S.D. 57301.

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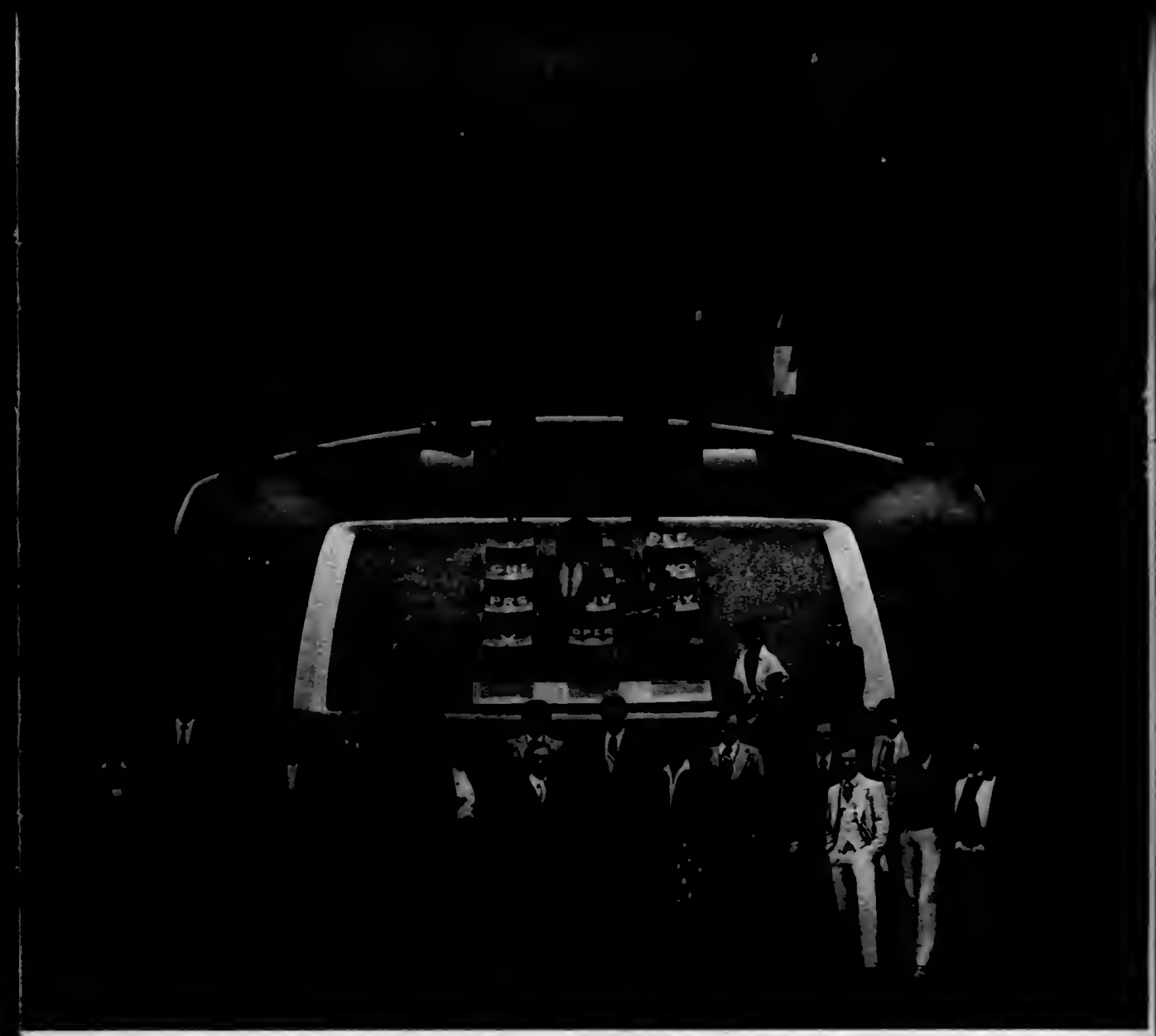

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Peripherals at NCC

Dennison Kybe Corp.

Dennison Kybe Corp. will introduce a new system for testing high-speed, high-density computer tapes at Booths 5518, 5519 and 5520.

The SLT-800 is said to clean and electronically evaluate the condition of a 2,400-ft reel of computer tape in 3¾ minutes. The company will also display several magnetic media products.

The SLT-800 also tests for proper loading characteristics on self-loading drives. The system is fully automatic and features an interlocked safety door to protect operators from injury. It uses a four-way cleaning technique and tape handling that emulates high-speed, high-density drives, the vendor said.

The 5LT-800 starts at $17,955 and is available from the vendor at 82 Calvary St., Waltham, Mass. 02254.

Eastman Kodak Co.

Eastman Kodak Co. will display its Reliant 800 microfilmer and the Kodak IMT-150 micro-image terminal at Booth 6600.

The high-speed microfilmer is said to capture document images on 16mm roll microfilm and automatically encode each image to facilitate computer-assisted retrieval.

The IMT-150 terminal can be linked with a computer to retrieve a specific document image for a micro-image access file, the vendor said.

Also on display will be the Komstar 200 micro-image processor, said to generate computer output on 16mm microfilm or microfiche instead of paper. It functions as an on-line, nonimpact, laser-printing device.

The Reliant 800 is available for between $11,000 and $26,000, the IMT-150 is priced between $13,000 and $15,000 and the Komstar 200 costs appoximately $118,000, from the vendor at 343 State St., Rochester, N.Y. 14650.

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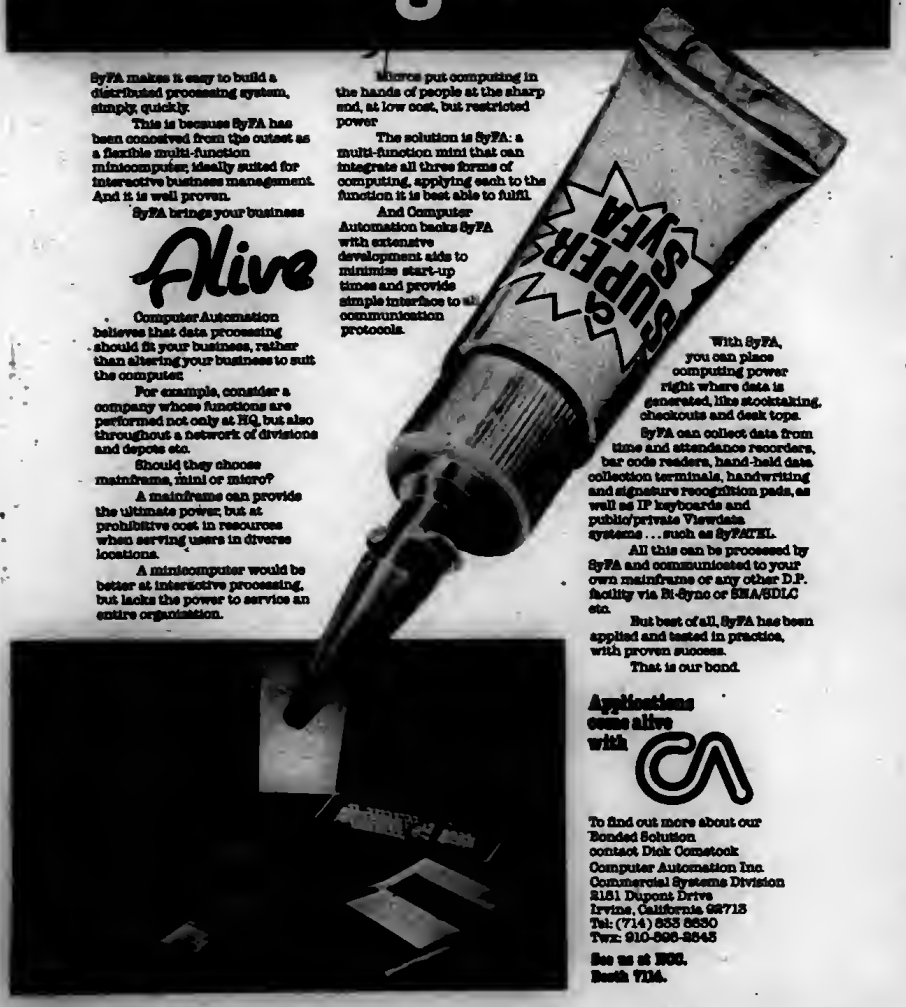

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See us at NCC. Booth 7114.

Peripheral Dynamics, Inc.

Peripheral Dynamics, Inc., at Booths 7008 and 7009, will be demonstrating its series of microprocessor-controlled manual-fed card readers.

The VMR130 series readers reportedly are capable of handling cards from 22 col to 155 col and employ a redesigned head assembly that can read a variety of marking instruments, including ball-point pens, flair-tip markers and pencils.

The unit has an 8085 microprocessor with 2K bits of random-access memory and 16K bits of read-only memory. It communicates with a computer via an RS-232C data communications interface. The VMR130 costs $425.

The firm is headquartered at 5150 Campus Drive, Plymouth Meeting, Pa. 19462.

Gimix, Inc.

A multiuser Winchester disk system from Gimix, Inc. will make its debut at Booth A101.

The Model 6809 system is said to support up to four terminals and features a 2 MHz CPU, 120K bytes of static random-access memory, a 19M-byte unformatted 5¼-in. Winchester hard disk, a 1M-byte unformatted 5¼-in. floppy disk and four serial I/O ports.

Memory is reportedly expandable up to 632K bytes. The system price of $8,998 includes the firm's OS-9 Level 2 operating system, the OS-9 Debugger, Text Editor and Assembler. Gimix is located at 1337 W. 37th Place, Chicago, Ill. 60609.

Quality Micro Systems

Quality Micro Systems, Inc. will display a variety of products, including several printer controllers, two printers and a label and bar code system, in Booths M261 and M263.

Among its products to be shown will be the Magnum 780-F label and bar code system based on a Datapoint Corp. CPU, and the firm's M3000 Printer Controller.

The Magnum 780-F costs $10,995 from the firm at P.O. Box 81250, Mobile, Ala. 36689.

Peripherals at NCC

Distributed Logic Corp.

An interface board and disk controller from Distributed Logic Corp. for use on Digital Equipment Corp.'s minicomputers will be on display at Booth 3108.

The Dilog DU132 interface board is said to provide streaming and start/stop tape backup for DEC's PDP-11/34 through PDP-11/70 minicomputers and VAX-11/750, 780 and 782 superminicomputers.

The disk controller, the Model DU218, mates DEC's PDP-11/04 through PDP-11/70 minicomputers with either 80M-byte Centronics Data Computer Corp. CDC-97862, 300M-byte CDC-9766 or equivalent storage module drive interface-compatible Winchester disk drives to emulate DEC RMO2- or RMO5-compatible subsystems.

The DU218 is functionally equivalent to DEC's RH-11/RMO2 controller and totally transparent to RSTS-E and RSX-11M operating systems, according to the vendor.

A single-unit DU132 is priced at $2,850 with the DU218 priced at $3,325. A streaming software package is also available for $350. Distributed Logic is located at 12800-G Garden Grove Blvd., Garden Grove, Calif. 92643.

Custom Systems, Inc.

Custom Systems, Inc. will introduce four new peripheral controller interfaces at Booths 6929 through 6930.

The interfaces will be added to Custom Systems' minicomputers, which are compatible with Data General Corp. and Texas Instruments, Inc. 990 series minicomputers.

The firm's ¼-in. cartridge tape controller reportedly interfaces two Kennedy Co. Model 6450 ¼-in. tape cartridge drives to any of DG's Nova or Eclipse minicomputers. One of its storage modular disk controller models emulates DG's 606X subsystems and interfaces the Nova and Eclipse with disk drive manufacture with storage module drive (SMD)-type or cartridge module drive-type interface. The other emulates TI's CD 1400 disk controller with standard DX10 software, according to the vendor. It interfaces the TI 990 series with most SMD-interface-type drives.

The firm's 990 multiplexer 16 Plus allows one full-size controller to handle two Centronics Data Computer Corp.-compatible high-speed parallel line printers and up to 16 RS-232-type terminals or serial printers, the vendor said. Each communications channel is individually programmable. A half-card version is available with 16 channels of programmable multiplexer only.

The vendor will also feature products introduced during late 1981 and 1982. These products will include the TI 990-compatible tape coupler and wire-wrap board and a programmable synchronous interface for DG's Nova and Eclipse.

The ¼-in. controller costs $1,390. The storage module disk is priced at $3,200. The TI disk controller is $3,450, and the 990 multiplexer is priced at $2,350.

The products are available from Custom Systems, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

Orange Micro

Orange Micro, Inc., at Booth A545, will demonstrate an intelligent printer interface for the Apple Computer, Inc. Apple II Plus and Apple III microcomputers.

The Grappler Plus board has all the features of the firm's original Grappler interface, including on-board firmware allowing text and graphics screen dumps with simple control codes, according to the vendor.

This product is compatible with Pascal and CP/M, includes a 5-ft cable and an operations manual. It costs $175, the vendor said from Suite G, 3150 E. La Plama, Anaheim, Calif. 92806.

Alpha Data, Inc.

A large-capacity Atlas disk drive, a 14-in. multiplatter device that offers from 80M to 100M bytes of storage, will make its debut at Alpha Data, Inc.'s Booth 6018.

Atlas incorporates multiple heads and advanced head positioning techniques to reportedly achieve average seek times of under 17 msec. Data can be accessed in contiguous 1M-byte sections due to the device's logical cylinders, which are organized in 1M-byte increments, a spokesman said. The device is storage module device- and Ansi-compatible.

Aimed at the OEM market, the disk drive costs $6,000 in quantity.

Other products shown by the firm include its M/Core solid-state memory system and the Model 80 head/track disk that provides up to 8M bytes of storage at an 8 msec access time.

The company is based at 20750 Marilla St., Chatsworth, Calif. 91311.

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Peripherals at NCC

Rosscomp Corp.

At Booth A704, Rosscomp Corp. will introduce a magnetic tape drive that is said to mount in the same space as a standard 8-in. flexible disk drive. Primary applications are as a backup for Winchester disk drives, file restructuring, file search, data exchange, data security and archival storage.

Among the features of the Rosscomp 160 are 160K-byte/sec. transfer rate, 20 min dump/restore time for 160M bytes and interfaces including Ansi. The drive employs 24 tracks with a recording density of 8,500 bit/sec. It also employs a two-track, dual-gap, read/write head, the vendor said.

The price of the drive is about $1,000 and is available from the vendor at 16643 Valley View Ave., Cerritos, Calif. 90701.

Printacolor Corp.

Printacolor Corp. will be demonstrating its GP1024 dot-addressable color ink-jet printer and other products in its computer graphics line at Booths 2025 and 2026.

The GP1024 printer is a high-resolution, Centronics Data Computer Corp.-compatible machine that responds to six control codes, the vendor spokesman said. Special fill characters are available to allow the user's data to be transmitted in compressed form.

The printer incoprorates a logic-seeking function — only printing the active portion of a line — and has a drop-on-demand ink-jet technology, which is said to minimize ink waste.

The device can print a 1,024 by 1,024 image with 120 dot/in. in less than five minutes, a spokesman for the vendor explained.

The desktop GP1024 costs $5,495 from the firm based at P.O. Box 52, Norcross, Ga. 30071.

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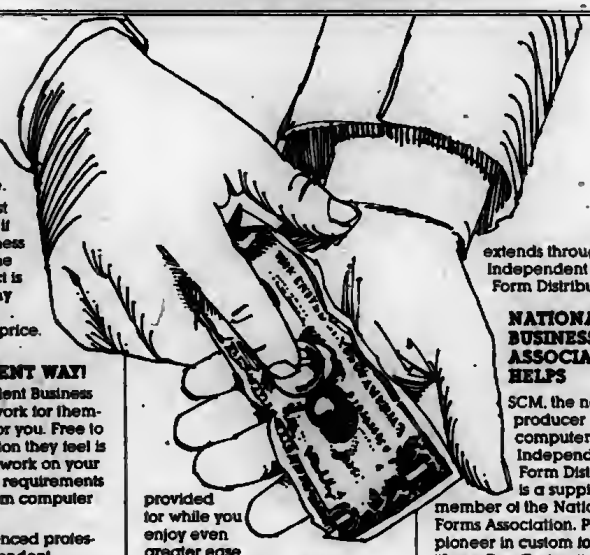

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Printer Products

Printer Products, a division of Capitol Circuits Corp., will be exhibiting its present line of miniprinters, along with unveiling Models S400 and S400T, at Booth A417.

These new items are software-controlled and configured to fit all point-of-sale, shipping, data logging, process control, instrumentation and validation systems, the vendor said.

The S400 is said to be a 40-col alphanumeric document/slip-style printer operating bidirectionally at 3 line/sec. The S400T uses a roll-style printer and prints at the same rate.

These products range in price from $450 to $795, according to Printer Products at 24 Denby Road, Allston, Mass. 02134.

TDX Peripherals Of GAW Control

TDX Peripherals, a division of GAW Control Corp., will introduce enhancements to their TDX tape drive at Booth A160. The enhancements reportedly allow the drive to communicate through RS-232 and IEEE standards.

It will reportedly also operate at 75 in. sec in-phase encode, nonreturn to zero or dual density. Interfaces to the Digital Equipment Corp. PDP-11 and LSI-11 are available.

The tape drive is available for $7,000 from the vendor at 148 New York Ave., Halesite, N.Y. 11743.

Wabash Datatech

Wabash Datatech, Inc., in Booths 1007 through 1009, will be spotlighting its line of 5¼-in. and 8-in. flexible disks, 8-in. medical diskettes and magnetic computer tape.

The firm's media products were designed for systems ranging from small business computers to large-scale mainframes. Some of its products — particularly its premium G-tape magnetic tape — are aimed at scientific applications.

Prices for the media are competitive, the firm said from its headquarters at 2700 Des Plaines Ave., Des Plaines, Ill. 60018.

Peripherals at NCC

Datasystems Corp.

Datasystems Corp., a Wespercorp subsidiary, will introduce its Winchester Series 5000 Disk Controllers for the Digital Equipment Corp. LSI-11 Q-bus and will be showing its Model 5121 for the Seagate Technology 5¼-in. drives at Booth 6906.

The Datasystems Winchester controllers reportedly were designed to be software transparent to DEC LSI-11 system software and diagnostics. The full line will include controllers for the Seagate ST506 Standard, the Shugart Associates, Inc. SA1000 Standard, the Ansi X3T9/1226 Standard and the Priam Corp. Standard. All are priced at $1,995.

Datasystems also will be showing its line printer controllers for DEC, Data General Corp. and IBM Series/1 minicomputers at the National Computer Conference.

Datasystems Corp. is located at 14321 New Myford Road, Tustin, Calif. 92680.

New World Computer Co.

New World Computer Co. will have a variety of disk drives and controllers on display at Booths 2735 and 2736, including its Mikro-Disc V family of Winchester disk drives for microcomputers.

The Mikro-Disc V drives are available in five models and offer storage capacities ranging from 2M bytes to 8M bytes. The units have a cylinder-to-cylinder access time of about .5 msec and a Bernouilli air filtration system. They can also be fitted with an optional removable cartridge and a Shugart Associates, Inc./Seagate Technology-compatible interface, a spokesman said.

The Mikro-Disc V controllers are available in S-100, Intel Corp. Multibus, Ontel Corp. and Universal Data Systems, Inc. configurations.

The disk drives cost $2,000 in single quantities while the controllers are priced from $700 to $1,900. Quantity discounts are available from the firm headquartered at 2805 McGaw Ave., Irvine, Calif. 92714.

Santec Corp.

Santec Corp., formerly Sanders Technology, will be exhibiting its Variflex Printer in Booth A661.

The multicapability product prints a full spectrum of documents for financial institutions, insurance firms, retailers, law and accounting companies, manufacturers and others. The Variflex Printer features 32 different typefaces and type sizes and performs page layout, according to the vendor. Printing is done on plain paper. Letter-quality printing is accomplished at speeds of 30- to 54 char./sec, while draft-quality production is performed at 130- to 390 char./sec.

The printer utilizes a 7- or 9-pin printhead. All diagnostics are incorporated in the printer, according to the vendor.

The unit measures 22½ in. wide, 18½ in. deep, by 7⅝ in. high and sells for under $4,000, the vendor said from 9 Columbia Drive, Amherst, N.H. 03031.

Data Systems Design, Inc.

Data Systems Design, Inc. will be showing its line of peripheral products for Digital Equipment Corp. processors at Booth A549.

On display will be the firm's 1M-byte on-line flexible diskette storage unit, the DSD 440, for LSI-11 or PDP-11 processors. The unit is compatible with the RX02 operating system and costs $3,895, the vendor said.

Also on display will be the DSD 880X/8/20/30, a line of Winchester or combination Winchester and floppy disk systems. The units are available with 8M, 20M or 30M bytes of formatted storage. The drives cost between $5,850 and $9,195, the vendor said.

A single-board controller/interface — the DSD 4140 — for attaching 8-in. floppy disk drives to LSI-11 Q-bus processors, is available for $1,250, the vendor said from its home base at 2241 Lundy Ave., San Jose, Calif.

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Peripherals at NCC

Diablo Systems, Inc.

Diablo Systems, Inc., at Booth 3716, will be showing its daisy wheel printer/terminal, which is said to print more than 400 char. from a single print wheel.

The Model 630 extended character set printer — which will make its official debut at the National Computer Conference — incorporates a printwheel that has two rows of 96 characters and a carriage that allows vertical movement to position these two rows for impact. As many as 250 additional characters or graphics can be constructed from the unit's 192-character set.

The printer costs about $5,000 from the firm at 24500 Industrial Blvd., Hayward, Calif. 94545.

United Peripherals, Inc.

Booth 4038 will be where United Peripherals, Inc. will display its 480M-byte disk subsystem for Hewlett-Packard Co. minicomputers.

According to the vendor, the UP-1698 high-density disk storage subsystem was designed to complement the HP 3000 series including Models 30, 33, 40, 44 and 64, as well as the HP 1000.

The heart of the subsystem — which costs $34,500 — is the 480M-byte Control Data Corp. 9775 fixed-module drive, according to a spokesman.

United Peripherals will also be showing its 9800 series 5M-byte Winchester Disk Storage Subsystem for HP personal professional computers at the conference booth.

The 9800 costs $3,450, according to the spokesman.

Also displayed will be Xebec, Inc.'s S1410 controller for Seagate Technology 5¼-in.-compatible drives, featuring multisourced gate-array technology.

United Peripherals and Xebec are Microcomputer Systems Corp. companies.

The S1410 costs $295.

Microcomputer Systems is headquartered at 432 Lakeside Drive, Sunnyvale, Calif. 94086.

Cynthia Peripheral

Cynthia Peripheral Corp., located in Booth 3402, will be exhibiting its Cynthia D145 intelligent disk drive, which combines 12M bytes of hard disk data storage and 12M bytes of disk-to-disk backup.

The product will reportedly perform all error handling and protocol interface functions without separate hardware interfacing or applications software changes.

The D145 is priced at $3,390, the vendor said from 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

Trak Microcomputer

Trak Microcomputer Corp. has introduced a new 5¼-in. floppy disk drive that reportedly is directly plug-compatible with Apple Computer, Inc.'s Apple II controller.

It is said to feature capacity 116K formatted and to be powered directly from the Apple. The suggested list price is $429. Trak 8-in. drives are said to be compatible with appropriate interfacing with these micros and S-11 based systems.

The vendor is located at 1511 Ogden Ave., Downers Grove, Ill. 60515.

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Power Systems at NCC

Elgar Corp.

Elgar Corp. will introduce its 1kVA Uninterruptible Power System Model UPS-102-1B here in Booths 3439 and 3440.

The device offers pulse-width modulated technology for an uninterruptible power supply. Some of the machine's standard features are slow slew/frequency window; overtemperature protection; charger failure protection; improved dynamic characteristics including response time, full kVA rating from .7 lagging to .9 leading and inverter efficiency of over 80%, according to the vendor. The optional full static switch includes automatic forward transfer after overload. Prices for the UPS-102-1B start at $3,000.

Elgar will also be showcasing its power line and ac line conditioners, high-isolation transformers and programmable ac power sources.

The company is headquartered at 8225 Mercury Court, San Diego, Calif. 92111.

Clary Corp.

An uninterruptible power supply (UPS) remote alarm and control panel will be on display at Clary Corp.'a Booth M127 here.

The control and monitoring device was designed to provide remote monitoring of a company's UPS. A bypass lamp is illuminated and an audible alarm is instantly triggered when the UPS goes into the utility bypass mode, or if the utility has failed and the inverter is operating on the battery. It also features a bypass select switch that will transfer the source of power going from output to load, from utility to inverter and vice versa.

The product is tentatively priced at $500, the vendor said from 320 W. Clary Ave., San Gabriel, Calif. 91776.

LaMarche Manufacturing

Uninterruptible power systems for 24V dc, 48V dc or 120V dc operation will be highlighted at Booth 2737 by LaMarche Manufacturing Co.

Sizes range from 500 VA to 20,000 VA and static switches are available for all models. Prices range from $1,068 to $24,643, according to the vendor.

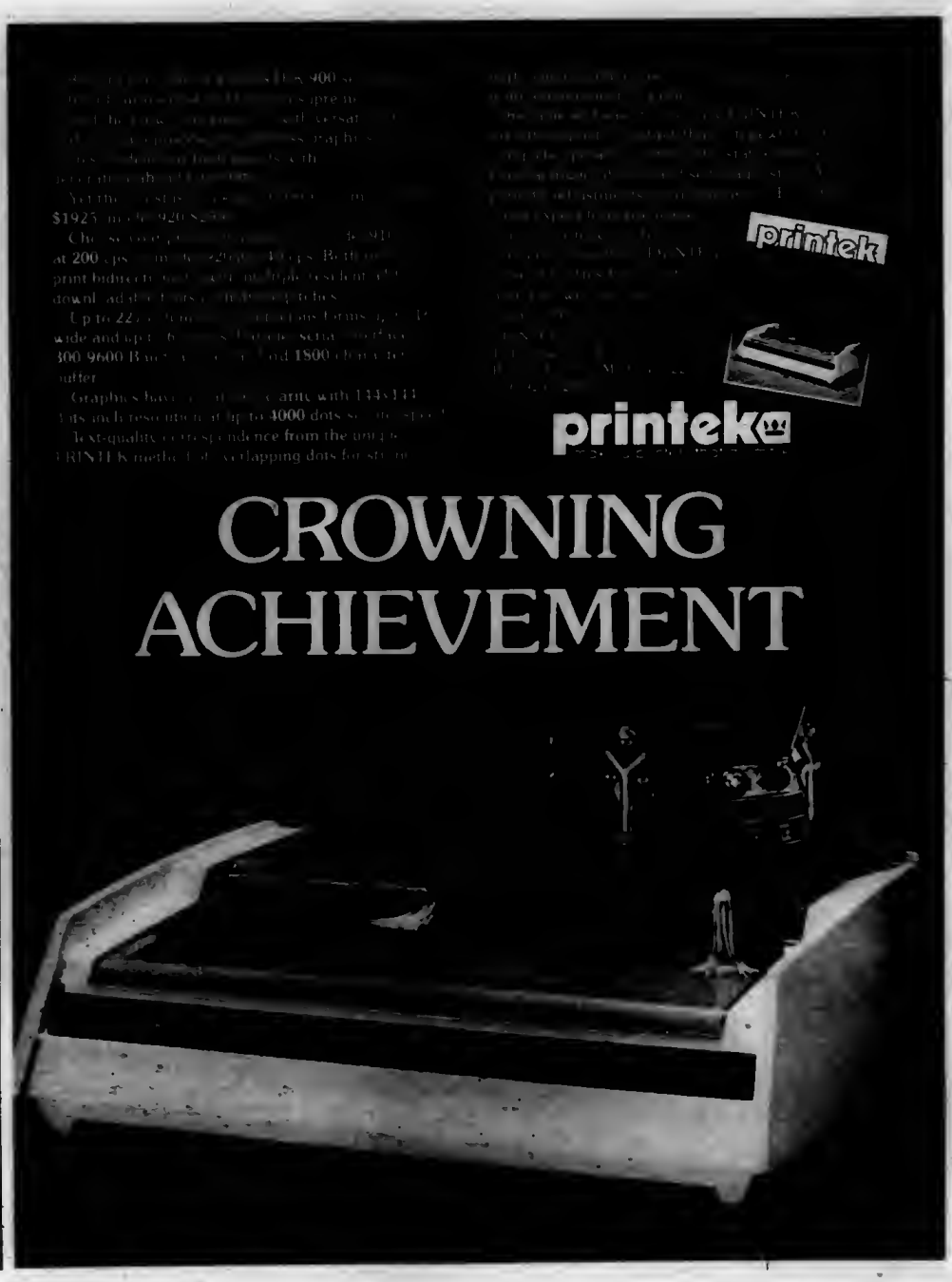
LaMarche Manufacturing Co. is headquartered at 106 Bradrock Drive, Des Plaines, Ill. 60018.

Electrical Filters, Inc.

Electrical Filters, Inc. will display in Booth M153 its line of filters for protection against electrical power line spikes and transients, the most common form of electronic downtime.

These items reportedly reduce downtime and errors as well as circuit board and transistor failures, the firm claimed.

The company is located at 2147 E. 3300 S., P.O. Box 9087, Salt Lake City, Utah 84109.



Power Systems at NCC

Lortec Power Systems, Inc.

At Booths 6902 and 6903, Lortec Power Systems, Inc. will unveil its 2kVA, single-phase Uninterruptible Power System (UPS) designed for data processing, process control, medical/hospital, newspaper publishing, telecommunications and other critical power applications.

Lortec's Continuac unit is intended to isolate smaller loads from disruptive aberrations on the incoming ac power line.

In this way, it eliminates the revenue losses, downtime/recovery time and equipment damage resulting from blackouts, brownouts, line transients and voltage fluctuations, the vendor said.

In addition to status alarm indicators configured in a power-flow diagram, the UPS performance monitoring system reportedly is equipped with digital metering.

The Continuac UPS is priced less than $6,000, the vendor said from 5214 Mills Industrial Pkwy., North Ridgeville, Ohio 44039.

Exide Electronics Corp.

A series of uninterruptible power supplies (UPS) for use on IBM 4300 series and compatible computers will be displayed by Exide Electronics Corp. at Booths 1907 through 1909.

The Series 2000 UPS is said to include a digitally synthesized waveform for lower harmonic content on the output of the UPS system. It also has a self-test capability that involves an internal step-by-step monitoring of all phases of start-up.

Other features include an intelligent front panel with keyboard push buttons and LED displays for conditions such as circuit-breaker status and individual power-circuit status, the vendor said.

The Series 2000 price range is from $17,500 to $52,000, depending on whether the series is single-phase, with 10- to 30kW; or three-phase, with 15- to 45kW.

Exide Electronics is located at 2 Penn Center Plaza, Philadelphia, Pa. 19102.

Liebert Corp.

Liebert Corp. will introduce its Sitemaster and Accommdate2 environmental control products in Booths 7909 to 7914.

The Sitemaster is a microprocessor-based monitor for Liebert power conditioning systems and system-related functions. It can monitor the operating conditions of one to 24 power conditioning systems from a central location. The system activates an audible visual and audible alarm when a potentially system-damaging situation arises.

The Accommdate2 is a computer room environmental control system that features an integral power conditioning system. It was designed for single-phase voltage supplies, the vendor said.

The module controls both temperature and humidity with solid-state reliability and precision. The power conditioning module is capable of maintaining computer-grade power even when input power is 40% below or 20% above nominal, according to the firm.

Prices for the products were not finalized by press time.

Liebert is located at 1050 Dearborn Drive, P.O. Box 29186, Columbus, Ohio 43229.

Emergency Power Engineering

Emergency Power Engineering, Inc. will exhibit its Powerbloc II emergency power system at Booths 6921 and 6922.

Powerbloc II is said to allow users to upgrade a motor generator set to a complete uninterruptible power supply system. The system operates only when normal utility power fails and can be used in a computer room as a stand-alone system or in multiple units, the vendor said. It was designed to provide backup power for all motor generator sets approved by users of IBM; Sperry Univac; Honeywell, Inc.; Control Data Corp.; and Amdahl Corp. computer equipment. The Powerbloc can also be used with IBM's 3089 power unit for its 3081 system, according to the vendor.

The Powerbloc II is priced at $26,000 to $35,000 depending on configuration.

Emergency Power Engineering, Inc. is located at 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

Dranetz Engineering

Dranetz Engineering Laboratories, Inc. will show four additional modules for its Series 626 Universal Disturbance Analyzer at Booths 8015 and 8016.

The modules monitor temperature and humidity, 400Hz and three-phase power sources, mass storage and communications functions, the vendor said.

The basic Series 626 was designed for IBM 370/165, 370/168, 3032, 3033 and compatible processors. It costs $3,690. Modules range in price from $450 to $1,475, the vendor said from its home office at 1000 New Durham Road, Edison, N.J. 08817.

Atlas Energy Systems

The first public showing of Atlas Energy Systems' Mini Power Conditioner (MPC) will happen here in Booth 3958.

The device was designed to supply computer-grade electrical power for medium-size to large minicomputers with power requirements of 10kVA to 25kVA. This product reportedly combines ride-through of an uninterruptible power supply with the power conditioning of a motor generator to provide 100% guaranteed power and uninterruptible rotational energy storage to bridge momentary power outages, according to the vendor.

Priced less than $12,000, the MPC is available from Atlas Energy Systems at 9457 Rush St., El Monte, Calif. 91733.

Topaz, Inc.

Topaz, Inc. will be showing its line of power conditioners and uninterruptible power supplies at Booths 5534 through 5536.

Products on display will include the firm's Powercenter Plus, a minicomputer power distribution system that offers a minimum of 85 db common-mode noise reduction and greater than 60 db attenuation of all transverse-mode noise, the vendor said.

Topaz power conditioners are priced from around $2,000, the vendor said from its home base at 3857 Ruffin Road, San Diego, Calif. 92123.

Gould, Inc.

Gould, Inc.'a Electronic Power Conversion Division will introduce a 45kVA uninterruptible power supply (UPS) at Booth 4518.

Using hybrid inverter technology, the 6000 series UPS reportedly features a display of operational status on an illuminated "mimic buss." The bus incorporates detail diagnostics that isolate problems to modules.

The Model 6456-1 is priced at $39,800 with a two-week delivery.

Gould is located at 2727 Kurtz St., San Diego, Calif. 92110.

. . . And Other Things to See

Key Tronic Corp.

Key Tronic Corp. will show a line of three new keyboard products at Booth 5505.

The Model P2402 features an enclosure capability for asynchronous 300 bit/sec serial RS-422 Ascii output of 9,600 bit/sec or Transistor to Transistor Level (TTL) output.

A 19mm keyboard said to meet reflectivity requirements of the Deutsches Institut fur Normung (DIN) specifications will also be on display, according to the vendor, along with the Screen-Contact board.

The Model P2402 is priced at $149 without enclosure and $212 with enclosure for one to nine units, the vendor said.

The 19mm keyboard costs $102 for one to nine units, while the Screen-Contact is priced at $76 for one to nine units.

Key Tronic can be reached through P.O. Box 14687, Spokane, Washington 99214.

Measurement Systems, Inc.

Measurement Systems, Inc. will display its DS-4 Demonstrator at Booth 5459 for control of interactive graphics and machines.

The DS-4, according to a company spokesman, gives eight different controls over joysticks and track balls thereby allowing users to have control over graphics when applied to point-to-point positioning, tracking, mapping or curve following.

Visual and tactile feedback will be provided by the different controls while performing selected tasks, the vendor said.

Users will be able to compare the differences between the various controls emphasized by the different tasks and select the control that fits their particular applications, according to the vendor.

Measurement Systems is located at 121 Water St., Norwalk, Conn. 06854.

Input-Ez Corp.

Input-Ez Corp. will display several new models of ergonomic workstations, adapters for existing furniture and printer stands at Booths A725 and A727.

The firm's terminal stand was designed to ensure that the keyboard and video screen are at the proper heights and distance from the operator and that input documents reside directly between the keyboard and the screen to allow single-axis vertical eye movement from data sheets to the screen.

The Input-Ez product concept integrates the keyboard and video unit into a unified assembly unit, which is adjustable to accept most terminals with detached keyboards, according to the vendor.

Many models of these workstations are available and are priced at between $184.50 and $967.75, the vendor said.

Input-Ez is located at 7330 S. Alton Way, Unit E, P.O. Box 3444, Englewood, Colo. 80155.

Very small terminals for IBM users.

The success of any computer network depends on its acceptance. That's where many systems fall short. The terminals on the market today simply don't fill the needs of today's offices. They're big, boxy and awkward to operate.

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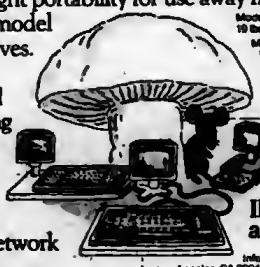
There's even an elegant wood case model with a "tuck away" keyboard for executives.

Is all this style reliable? You bet. In just ten years Informer has produced over thirty thousand units for demanding installations like banks and insurance companies.

You'll also be surprised at how much you can save with these units.

If you're interested in a computer network that works harder for you, think about Informer. Because, you can lead an employee to a terminal, but you can't make him use it.



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Model D Data Entry Terminal 9" CRT
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Dilithium Press

BEAVERTON, Ore. — Dilithium Press, which publishes computer-related books, will have several on display at Booths 1905 and 1906.

Some of the titles on display will include *Basic Basic-English Dictionary*, by Larry Noonan, $10.95. It alphabetically lists all commonly used Basic commands, statements, operators and special keys and then translates them for use on Apple Computer, Inc.'s Apples; Total Information Systems, Inc.'s PET; and Radio Shack's TRS-80 computers.

Other titles include *Computer Architecture and Organization (With Examples Using the PDP-11)*, by Theodore Meyer Jr., $16.95; and *Compu Guide: The Consumer's Guide to Small Business Computers*, by Martha Eischen, $14.95. Dilithium Press is located at P.O Box 606, Beaverton, Ore. 97075.

Computer Science Press, Inc.

Computer Science Press, Inc., a publisher of professional, reference, college, high school and elementary textbooks in the field of computer science, will be exhibiting some of its materials at Booth 6016.

Among its offerings will be *Jewels of Formal Language Theory* by Arto Salomaa, which is available for $26.95; *Principles of Database Systems* by Jeffrey Ullman, priced at $22.95; and *Fundamentals of Data Structures* by Ellis Horowitz and Sartaj Sahni, which is available for $23.95. Also on display at the booth will be *The Nature of Computation: An Introduction to Computer Science* by Ira Pohl and Alan Shaw, which carries an $18.95 price tag, according to a spokesman for the vendor.

Computer Science Press, Inc. is located at 11 Taft Court, Rockville, Md. 20850.

DELTAK and CW Communications can help you make an intelligent decision about Business Personal Computers

Conference Journal

Computerweek

During COMPUTERWEEK, a national conference presented by the publishers of *Computerworld, Computer Business News* and *Infoworld*, DELTAK videotaped a broad range of sessions by industry experts sharing their insights into business personal computing. These sessions are now available as a Conference Journal, *Personal Computing: A Business Perspective*, exclusively from DELTAK, the world's leading producer of video-based DP and management training programs.

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Afips Press

The American Federation of Information Processing Societies, Inc. (Afips), which puts on the National Computer Conference, will exhibit at Booths 3522 and 6017 its publications through its publishing arm — Afips Press.

The *1982 National Computer Conference Proceedings* will be available at the exhibit for $40 and after the conference for $80, plus $3.50 in postage and handling, according to a spokesman.

Afips can be reached at Suite 800, 1815 N. Lynn St., Arlington, Va. 22209.

Prentice-Hall, Inc.

Prentice-Hall, Inc. will be showcasing its line of computer texts, including several recently released volumes on computer science and engineering, at Booths 7000 and 7001.

The publisher's titles include several new works on microcomputers and microprocessors, solid state electronics, systems and systems theory, computer architecture and software engineering, a spokeswoman said.

Prentice-Hall is based in Englewood Cliffs, N.J. 07632.

Ecos Electronics Corp.

Ecos Electronics Corp. will be showing its Model 7106 Accu-Test, a ground impedance tester, at Booth A604 at the National Computer Conference.

Designed for 120/208 Vac circuits, the pocket-size unit can be used by field service personnel to detect ac power and grounding problems in circuits supplying computers and related DP equipment.

The unit costs $39.95, the vendor said. Ecos can be reached at its corporate offices at 205 W. Harrison St., Oak Park, Ill. 60304.

. . . To See at NCC

Transaction Security Ltd.

Transaction Security Ltd. will be exhibiting its turnkey security systems at Booth 5249.

Its major product line is Verisign II terminals for automated personal identification using handwritten signatures. It includes an electronic digitizer pad and pen assembly. Each individual's coded signature measures may be held in a few bytes of data and stored on a credit card, on a centralized data base or within a terminal, the vendor said.

Verisign II terminals come in two models: The VS-130 Credit Authorization Terminal costs $2,000. The VS-110 Access Control Terminal is available for $6,000. Both terminals are microprocessor-controlled and are said to contain the full logic to validate signatures.

The VS-110 includes a keyboard, display and card reader. All Verisign II terminals provide standard interfaces to enable them to be attached to host computers, intelligent terminals or physical access control equipment.

The vendor can be reached through P.O. Box 72, Barratt House, Chestnut Ave., Guildford, Surrey, GU2, 5HJ, England.

Simplex Time Recorder

Simplex Time Recorder Co. will be showing its line of electronic time clocks at Booth A423.

On display will be the firm's Electronic Time Calculator. The unit is an on-line timekeeping/editing unit that systematically provides printed time records, the vendor said.

The Electronic Time Calculator costs $3,195, Simplex said from its home office at Simplex Plaza, Gardner, Mass. 01441.

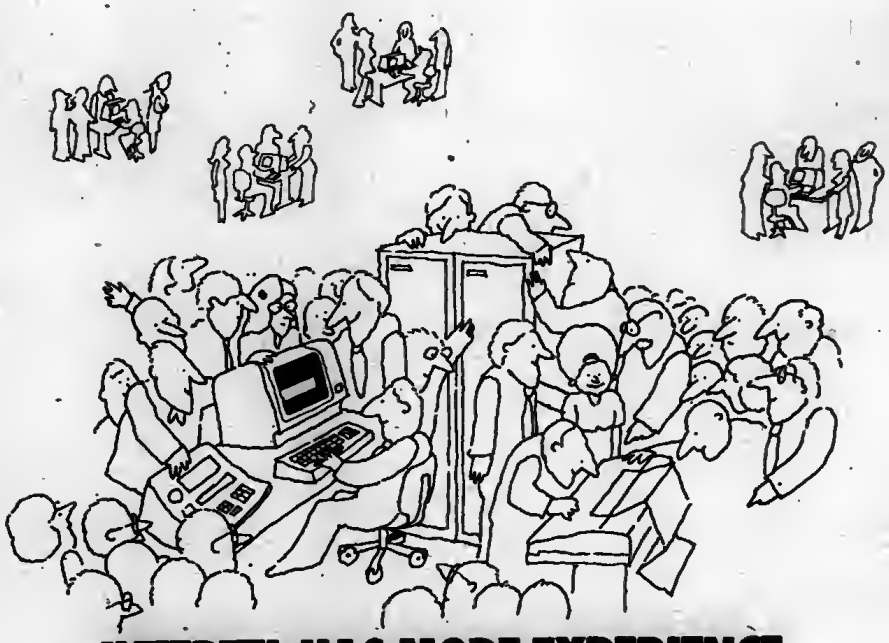
Moniterm

A three-bit emitter-coupled logic interface for its VR series high-resolution monitor will be shown by Moniterm Corp. in Booth M241.

With the interface, the VR-800 and VR-1000 monitors reportedly can display two, four or eight discrete levels of intensity while running at horizontal frequencies up to 64K Hz, generating a noninterlaced raster of 1,024 lines of a refresh rate of 60 Hz.

For word processing, photocomposition and micrographics, the VR-1000 provides 100 line/in. of resolution in vertical and horizontal dimensions with up to eight levels of intensity.

The interface comes as an option and costs $100, Moniterm said from 7180 Shady Oak Road, Eden Prairie, Minn. 55343.



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SEE US AT NCC - BOOTH #A235

Other Things to See at NCC

Management Information Corp.

Management Information Corp. (MIC) will announce a service at Booth' 7010 that provides companies with an information service library. MIC will provide information on business microcomputers and minicomputers, distributed processing systems, program packages, data entry systems, data communications and other topics.

The MIC Executive Information Library consists of 20 reports, including six monthly subscription services, 14 reports on data processing, five computer posters and the MIC Telephone Information Service, the vendor said.

The service is available for $1,875 from the vendor at 140 Barclay Center, Cherry Hill, N.J. 08034.

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Tratec

Tratec, a division of McGraw-Hill International Book Co., will be offering descriptions of its sales and marketing program offerings at Booth 4035.

Courses available from the training group include the following selections: "Marketing in the Eighties," "Strategic Selling Skills," "Manager in the Middle," "Industry Orientation Programs," "Winning Through Customer Service" and "Customer-Oriented Selling."

Tratec is located at 2999 Overland Ave., Los Angeles, Calif. 90064.

Technology Transfer

Technology Transfer Institute will present a three-dimensional holographic exhibit here at Booth 4958.

The exhibit is comprised of state-of-the-art communications devices ranging from computers to satellites.

The company is headquartered at 741 10th St., Santa Monica, Calif. 90402.

Cyberex, Inc.

Cyberex, Inc. will unveil its computer-aided telephone diagnostics (CATD) system in Booth 2030.

Said to be the first system to transmit analog signals by phone, CATD is a service for uninterruptible power systems and other power conditioning equipment.

The system links by telephone the user's power conditioning equipment with its Cyberserve service organization.

CATD is said to provide the benefits of the on-site analytical skills of a service engineer within minutes of identified need, 24 hours a day, seven days a week. Cost to subscribe ranges from $5,000 to $10,000, a spokesman said from 1130 Hanna Building, Cleveland, Ohio 44115.

Office Automation Planning And Implementation . . . Are You Making the Right Decisions?

THE OA FORUM
Sponsored by InfoWorld and Computerworld OA
September 13-15, 1982
Marriott Long Wharf, Boston

Dr. John McQuillan, President, BBN Information

Amy Wohl, President, Advanced Office Concepts Corp.

Howard Anderson, President, The Yankee Group

The OFFICE AUTOMATION FORUM will give you the information you need in three days of sessions that will address the main issues facing EDP professionals in word processing, electronic mail and office automation. You will get specific answers to these major questions:

First day: Personal Computers in the office — are they the answer to office automation and distributed processing?

Second day: DP vs. WP in Office Automation — how can DP expedite office automation in human terms and with bigger corporate payoff?

Third day: In-Depth Seminars in Advanced Communications and Office Automation — how can communications tie systems and users together for optimum use of company resources, for today and tomorrow?

Attend the day of your choice, any two, or all three days.

The sessions will be practical with an emphasis on leading user and consultant experiences. Many of our speakers have written articles for *Computerworld OA* or *InfoWorld* and some of the editors will chair panels. There will be a full schedule starting with "Early Bird" sessions at 7:30 a.m. and ending with evening discussions and practical first-hand advice.

Speakers will include:

Monday, Personal Computers in the Office
Dr. Harold Kinne, President & Founder, Halkin Computing Corp.
"The Future of Information Appliances"
Jean Yates, Gnostic Concepts
"Micro Operating Systems"
John Dvorak, Editor, *InfoWorld*
"New and Future Products"
Maggie Canon, Editor-In-Chief, *InfoWorld*,
Panel: "Personal Computers in the Office"
Howard Anderson, President, The Yankee Group
"The IBM Personal Computers: The Effects on the Industry"

Tuesday, DP Role in Office Automation
Amy Wohl, President, Advanced Office Concepts Corp.
"Achieving the Possible"
Patty Seybold, Editor, The Seybold Report
Dr. John McQuillan, President, BBN Information Management and *Dr. Michael Zisman*, President, Integrated Technologies Inc.
"OA Survivors Guide to Multivendor Environments"
Evelyn Wilk, Consultant, Arthur Andersen & Co.
"Management and Professional Work Stations"
Alexandra Corson, Program Director, IDC.
Panel: "IBM Software Strategy"
Dr. Warren Briggs, Suffolk University
"Distributed Decision Support Systems"

Wednesday, In-Depth Communication Seminars
Dr. Dixon Doll, President, DMW Group
"PBX Role in Office Automation" & "Teleconferencing"
Thomas A. Hannagan, President, Hannagan & Associates
"Electronic Mail: Systems Selection and Implementation"
Dr. Michael Hammer, Associate Professor, MIT
"Planning OA Programs"

Dr. Michael Zisman, President, Integrated Technologies Inc.

Costs for the OA Forum are: Personal Computers in the Office (Sept. 13) $145; DP's Role in Office Automation (Sept. 14) $245; In-Depth Advanced Communications Seminar (Sept. 15) $295 (includes seminar materials and professional course instruction). A special three-day combo registration is only $595 which includes lunch daily.

Save an additional 10%: Register by August 2, and we'll bill you later. Team or group rates available on request.

To register, or for more information, call Louise Myerow, Registration Manager, **toll free 1-800-225-4698** (in Mass. call collect 617-879-0700).

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( ) In-Depth Seminars on Office & Communication Technology, Sept. 15, $295.

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Other Things to See at NCC

Graham Magnetics, Inc.

Tape evaluating and cleaning equipment from Graham Magnetics, Inc. will debut in Booths A705 and A706.

The Detector II is a microprocessor-controlled tape cleaner equipped with a vacuum-grid cleaning system that operates at 300 in./sec. The unit reportedly can clean a 2,400-ft tape in 3.3 min. The price of the Detector II is $5,450, the vendor said.

The Protector is said to clean debris from the inside of self-loading cartridges using vacuum technology. The Protector costs $1,785.

Quantity discounts for both are available from the firm at 6625 Industrial Park Blvd., North Richland Hills, Texas 76118.

Trend-DLC, Inc.

A microprocessor-based intelligent Tape Prep and Editing System from Trend-DLC, Inc. will debut in Booths 2004 and 2005.

The Model RPT-48 is said to offer a low-cost alternative to the numerical control user's tape editing and programming needs.

Designed to operate with any RS-232C printing terminal, the unit features seven transmission rates from 110- to 9,600 bit/sec.

The RPT-48 costs about $3,400; with terminal, the price is about $4,900.

Trend-DLC is located at 280 Midland Ave., Saddle Brook, N.J. 07662.

Tektronix, Inc.

Tektronix, Inc. will introduce a number of oscilloscopes in Booths 7022 and 7023.

The low-end 2213 and 2215, priced at $1,100 and $1,400, respectively, are dual-trace, delayed-sweep instruments said to achieve 60 MHz at 20 mV to 10V and 50 MHz at 2-, 5- and 10-mV settings.

The 2300 series of portable oscilloscopes are 100 MHz, dual-trace instruments with delayed sweep. The 2335 costs $2,775, the 2336 costs $3,075 and the 2337 costs $3,350.

The Model 468 Digital Storage Oscilloscope is said to increase digital storage bandwidth limits, detect aliased signals and correct envelope error and display jitter. Base price is $5,750.

Tektronix can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Randomex, Inc.

Randomex, Inc. will show its line of disk maintenance equipment including the Randomex 750, a disk pack inspector, at Booth 3429.

The 750, which will make its debut at NCC, is a motorized inspection device. Features include 30,000 candle power illumination and precision comb-gauge assemblies to check tolerances on most pack types.

The unit costs between $2,700 and $3,750.

The corporate offices of Randomex are located at 1100 E. Willow St., Signal Hill, Calif. 90806.

Qume Corp.

Qume Corp. will display its Multistrike III ribbon for use in the company's printers and terminals at Booth 7119. The ribbon is said to yield about 300,000 char./cartridge.

It features extended arms that act as ribbon guides for ribbon exit rewind.

The ribbon and cartridge assembly costs $5.65 from the vendor at 2350 Qume Drive, San Jose, Calif. 95131.

International Computer

International Computer Programs, Inc. will display its line of publications in Booths M126 and M128.

The company will be giving out free samples of its "ICP Software Business Review" and familiarizing NCC attendees with its Interface series of publications.

The company is located at 9000 Keystone Crossing, P.O. Box 40946, Indianapolis, Ind. 46420.

ACL, Inc.

ACL, Inc. will display its ACL-300 portable static locator and its EDP Staticide antistatic fluid at Booth 3553. The locator is for static measurements around electronic components.

The antistatic fluid was designed to eliminate static problems in these areas and can be sprayed on carpets, clothing, draperies and other textiles as well as hard surfaces such as floors, furniture, fixtures, terminals, cassettes and other computer equipment. It comes in a 1-qt spray container.

The ACL-300 costs $299.95, and the EDP Staticide costs $8/quart from the vendor at 1960 E. Devon, Elk Grove Village, Ill. 60007.

PRC Of America

PRC of America, a division of Plastic Reel Corp. of America, will reveal four new products for shipping and storing computer tape, floppy disks and disk cartridges at Booth 3554.

The products include the Data Vault storage cases 23011 and 22032 and the DV3-24-25 and DV4-25-25.

Both the DV3 and DV4 are constructed of polyethylene while the Data Vault 23011 is constructed of polystyrene with an Underwriters Laboratories, Inc. flammability classification of 94V-0, the vendor said. The Data Vault 22032 is constructed of polypropylene.

The DV3 and DV4 cases are priced at $48 each. The Data Vault 22032 is priced at $6 each, while the Data Vault 23011 is priced at $10.

PRC is located at 841 Mountain Ave., Springfield, N.J. 07081.

Steelcase, Inc.

Steelcase, Inc. will be showcasing at Booth 3528 its Ultronic 9000 systems furniture, which reportedly accommodates all makes and types of electronic office machines.

Ultronic 9000 components include split-level work surfaces, pullout shelves for keyboards and free-standing stotted-top printer tables. Also on display will be 90° and 120° workstations, an adjustable VDT stand, a palm rest, a larger machine carousel and new workstations that accommodate two or three workers.

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Provides technical assistance to our Systems Department personnel in using a variety of software aids. Requires excellent communication skills as well as planning, organization and scheduling ability. Will provide consulting, trouble shooting and as necessary the code, execs, procedures, implementation, training and documentation for these technical areas: PEACS, SCRIPT, APL, ADRS and other department software; 3800 printer software, system libraries and PAR VALET; operating and timeshare systems (VS1, MVS, CMS, VM/SP); data base (includes VSAM files); CICS; SNA (ACF/VTAM). We require some knowledge of the above mentioned technical areas, and at least two years experience including applications programming, systems programming and computer operations.

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California State Automobile Associaton has an opening in our Information Center for a systems analyst. Applicants should have excellent communication ability and be able to instruct and work with user departments in establishing and maintaining user created systems. Hardware will consist of micro computers, IBM 3278 Terminals, and IBM 3033 mainframes. Candidate should have experience in BASIC and a non-procedural language such as ADRS, FOCUS, RAPIS, or INQUIRE. Two years related work experience desired.

PROGRAMMER ANALYST

This position will perform systems analysis and programming work. Must be knowledgeable in all phases of the systems development life cycle, have excellent communication skills and be able to relate well to users and work in a team environment. Prepare analysis and reports for feasibility of manual and computerized systems, design manuals and specifications for computer systems, perform analysis and coding of computer programs and do testing and conversion of computer systems. Know structured design and coding concepts, interactive systems, Librarian Facilities, OS/JCL and Utilities. We require a college degree plus a minimum of three years technical expertise in ANS COBOL, JCL, VSAM, CICS Command Level, SCRIPT etc.

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Systems programmers with 2 years recent experience in generating, maintaining and tuning CICS/OS/VS, ACF/VTAM, ACF/NCP and associated teleprocessing systems software. Extensive problem diagnosis, heavy debugging of CICS Command Level, IBM Assembler.

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Position requires a minimum of three years of programming experience in a utility, manufacturing or distribution industry. Applicant must have working knowledge of materials management/inventory control systems in an on-line data base environment. Programming experience with System 370 DOS/VS(E) and CICS Command Level is a prerequisite. DL/1, VSAM and PL/1 experience is highly desirable.

PROGRAMMER

Position requires formal training and a minimum of two years of PL/1 or COBOL programming in a CICS command level environment. Experience with 370 DOS/VS(E), DL/1, VSAM is desirable.

SYSTEMS PROGRAMMER - DATA COMMUNICATIONS

Position defines communications requirements; plans, implements, and supports network operations. Experience with IBM data communications facilities including Assembler, VTAM, BTAM, NCP and EP on 3705, SNA, modems, lines, terminals, network operations, and computer applications is required. Experience with DOS, CICS, VM, CMS, VSAM, DL/1, PL/1 and DDP are desirable.

All positions are located at the Idaho Power Company Corporate Headquarters in Boise, Idaho.

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VIDEO TECHNICAL SPECIALIST

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Software Development

Marquette Electronics Inc., a leader in ECG and patient monitoring equipment is currently seeking to add a qualified engineer to become part of a team that is making a significant contribution to computerized electrocardiography.

The applicant should be a degreed engineer, or equivalent with a demonstrated interest in software development for medical application. Experience in FORTRAN programming as well as the ability to problem solve using a logical, straight forward approach will also be required. Prior exposure to a medical environment will be a definite plus.

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ELECTRONICS ENGINEERS

A number of openings exist of all levels for engineers with design and test experience with mini-computer specialized digital interfaces. Some travel will be involved in these positions. A BSEE or equivalent is required. Shared memory and software design experience a definite plus.

SYSTEM TEST ENGINEERS

Responsible for the development of test plans, specifications and procedures pertaining to system and program level testing of tactical C^3I Data Systems. Tests will be performed in Austin and on-site. A degree in engineering or computer science with 3 - 9 years experience in testing of computer based systems is required.

SCIENTIFIC PROGRAMMERS

Perform numerical and digital computer analyses on engineering and scientific problems associated with real time command and control applications, operating systems for mini-computers, and graphics. Will prepare appropriate reports and develop software descriptive documentation. A college degree plus three years of design and development of software with mini-computer experience utilizing assembly language or high order language is essential. Experience with DG Eclipse or Rolm 1666 highly desirable.

SYSTEM REQUIREMENTS ENGINEERS

Responsible for the analysis of problems related to tactical C^3I Data Systems. Perform trade-off studies and propose engineering solutions. Develop system and software performance specifications to direct the engineering development activity. Evaluate military user feedback and define corrective action. A degree in engineering or computer science with 3 - 9 years experience in computer based systems is required.

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Investigate, analyze, repair and/or teach maintainability aspects of mini-computer equipment. A BSEE or equivalent, four years of related experience, previous field service, and effective communicative skills are required. Experience with mini-computer lines, especially set-ups with shared memories, and specialized interfaces is a definite plus. The successful candidates must be willing and able to accept a foreign assignment, on bachelor status, for not less than twelve consecutive months.

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85 Government Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other _____

TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP/MIS Srvs
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mtg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other _____

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. Rte. 30 Box 880 Framingham MA 01701 9985

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COMPUTERWORLD

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DATA PROCESSING CONSULTANTS

Development Technologies

Several outstanding opportunities exist in San Francisco for Technical Consultants to research, develop and implement new systems methodologies. Tha qualifiad candidates should possess:

- Experience in State-of-the-Art structured programming and design techniques, and systems development life-cycle methodology.
- Managerial and planning experience
- A strong desire to be a Pioneer in leading-edge technology.

Salary commensurate with experience and abilities. We are consultants to management. Please send resume to:

CW-A3262
Computerworld
Box 880
Framingham, MA 01701
Employer assumes fee.

SYSTEMS ANALYST

FRANCISCAN CERAMICS, INC., a nationally recognized manufacturer of quality dinnerware and tile has an immediate opportunity for a Systems Analyst:

The successful candidate will have experience in analyzing, designing and implementing systems in manufacturing or accounting. Bachelors degree in a related field preferred.

We offer a salary commensurate with your experience and competitive benefit package. For confidential consideration, please send resume to Marla Deglow, Employment Manager

FRANCISCAN CERAMICS, INC.

Member of Wedgewood Group
2801 Leo Pelle Blvd.
Los Angeles, CA 90039
Equal Opportunity Employer M/F

PHILADELPHIA

SR PROGRAMMER/ ANALYST TO 28K

Scientific testing firm in Center City PHILA reqs 2 yrs COBOL or PL/1 on IBM 43XX DOS. Must know DB/DC. SPSS or SAS very helpful. Excellent GROWTH POTENTIAL. Top Benefits

Contact: Regina Nordeman

ROBERT HALF OF PHILADELPHIA, INC

3000 Market St. Suite 706
Philadelphia, PA 19103
(215) 568-4580

THE FUTURE IS NOW!

THE CHALLENGE IS YOURS!

CHOOSE YOUR DIRECTION!

PROGRAMMER/ANALYSTS

Martin Marietta Data Systems, a leader in state-of-the-art data processing technology, has IMMEDIATE OPPORTUNITIES available in the most desirable locations for your active lifestyle.

Bask in the warmth of success in Orlando, Florida, where a thorough knowledge of COBOL, FORTRAN, IMS DB/DC and OS/MVS, will make your future a brilliant one...or

Take it to new heights in exhilarating and dynamic Denver, Colorado. Two or more years experience programming in COBOL on large scale IBM systems running under IMS DB/DC will give you an opportunity mora challenging than a giant slalom...or

Make yours a capitol CAREER in one of our country's most polished urban centers, Washington, D.C., and let your knowledge of sophisticated IBM & DEC business systems creata a dynamic future for you.

If it's a challenging career you seek where the opportunities for ADVANCEMENT are continuing, look into Martin Marietta Data Systems today! Our BENEFITS and SALARIES are outatanding. And, our PROFESSIONALISM is known throughout the world.

Make your career one that offers OPPORTUNITY... CHALLENGE... SUCCESS. For a prompt and confidential review, please send your resume or letter of inquiry to the location you'd like to explore further.

Mr. G. LeAndre
P.O. Box 5837, M.P. 357
Orlando, Florida 32855

Mr. C.W. Byars
6303 Ivy Lane
Greenbelt, MD 20770

Ma. Brigitta Rauman
98 Inverness Dr. East, Suite 120
Englewood, CO 80112

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MARTIN MARIETTA DATA SYSTEMS

Where The Future Is Happening Today!

MARTIN MARIETTA

HARDWARE SERVICES MANAGER

We are: A leading system's house based in the New York metropolitan area, specializing in financial information and telecommunication systems.

We need: A Hardware Services Manager who has an extensive background in the mini-computer industry. Experience with DEC or similar machines will be a strong recommendation. A good working knowledge of telecommunications is also required. The individual we seek will probably have worked in field service for a period of 4/5 years before moving into a management responsibility.

We offer: Income in excess of $45,000 (excellent bonus opportunities), company car, outstanding fringe benefits and a challenging opportunity to grow with a dynamic company.

Please apply in confidence with resume and salary record to...

Dept FS-909, PO Box 1060 FDR Station
New York, N.Y. 10150

An equal opportunity employer

DALLAS

SR. DATA BASE ANALYST

Enhance your career with prestigious, progressive firm who provides employees the opportunity to stay in the forefront of D.P. Must have 3 yrs. of Data Base exper. including 1 yr. of IDMS. Assist in new D.B. design. Low $30's.

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DATA PROCESSING CAREERS INC

DATA CENTER DIRECTOR

Omaha base Data Processing Center with Burroughs Medium System serving multi-thrift institutions in need of a strong manager. Duties will include strategic planning in addition to directing operations. Requirements: Business degree, 3-7 years Service Bureau experience. Financial or thrift background preferred. Send resume only including comparable work history and salary to

CUP'S, INC.
4848 South 120th St.
Omaha, NE 68133

Data Processing Professionals

Do you want to work for a winner who offers you challenge and outstanding career opportunities? We seek professionals in the following areas:

APPLICATIONS PROGRAMMERS
SYSTEMS PROGRAMMERS
SYSTEMS ANALYSTS
SENIOR PROGRAMMERS

Mission offers a generous fringe benefit package that includes full employee health, dental and life insurance, education reimbursement, paid vacation, holidays and free parking. For more information please call or send resume to: Carmen Jordan

(213) 381-6811, Ext. 2749

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Data Communications Systems Programmers

who see things in a different light...

...whatever the endeavor or area of interest, the Electronic Banking Services Division of Bank of America has traditionally been an innovative force in electronic banking and diversified financial services.

Today, our International Network Services Department, headquartered in San Francisco, is continuing this tradition. Projected to be a high-growth area within our bank, the long-term projects of this department will help define the future of data communications systems networks. While providing support for a number of applications for World Banking operations, they will also be providing the analysis and design of logical data communication networks in a packet switching environment.

To qualify, you will need 2 or more years' in a data communications environment,including:

- Previous background with strong emphasis in systems analysis and systems programming.
- Experience with asynchronous and bisynchronous protocols, and an understanding of X.25 packet switching technology.
- Familiarity with various private network designs such as point-to-point and multidrop networks.
- Experience performing 3705 sysgens and knowledge of public packet networks would be pluses.

Bank of America offers competitive salary and benefits and relocation assistance. For confidential consideration, write or send resume (and be sure to include department number) to: **Leonard "Bernie" Bernstein, Bank of America, Dept. 3416-B, P.O. Box 37000, San Francisco, CA 94137.** An equal opportunity employer.

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Fortran Real Time	$21-28k
Technical Analyst 4341 OS	$22-37K
#2 Spot. 370 and 34	$26-38K

Resume to Carol Stuart, D.P. Division
ETHAN ALLEN PERSONNEL AGENCY
30 W. State St.
Binghamton, N.Y. 13901

NEW TECHNOLOGIES

Fortune 500 communications company is seeking an uncommon technical talent to advise and assist its broadcast, cable and publishing divisions as they move into new technological areas, including teletext, videotext, interactive services and satellite distribution. The individual chosen for this position will be the corporate technical expert in these areas. Requirements include (a) a broad technical background that crosses between data processing, data communications and RF technologies, or (b) a depth of technical expertise that will allow you to cross over the technologies. Excellent compensation. Relocation to Southwest would be required.

Reply to CW-A5800, Computerworld, Box 880, Framingham, MA 01701

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TEXAS PROJECT MANAGER

Salary $Open. Sunbelt location. Degree required or experience will substitute. COBOL, on-line, any hardware is acceptable. 4+ yrs. supervisory experience is mandatory along with magazine or newspaper circulation application exposure. Excellent earnings/benefits/bonus potential along with some travel.

Contact: Bob Gabbard

ROBERT HALF of San Antonio, Inc.
Suite #900
Interfirst Financial Center
San Antonio, TX 78201
TX (512) 736-3467
U.S. 1-800-531-5400

DATA PROCESSING MANAGER-HOSPITAL

Lourdes Hospital, Lafayette, LA is seeking an individual with a degree in Computer Science and 2 to 3 years experience to work with IBM System 38 and a staff of 6.

Contact: Personnel
Our Lady Of Lourdes Hospital
P.O. Box 4027-C
Lafayette, LA 70501
(318) 234-7361, Ext. 4106

SENIOR PROGRAMMER ANALYST

A candidate for this position must have a M.S. degree in Computer Science or Engineering, minimum of two years experience in Burroughs Series B2000 and B6000 Computers, DMS II, message control system, advanced reporter II, NBL, CANDE, DMS II inquiry, ANSI COBOL 74 and WFL software; and data base, communication systems and program design. Must have design system for a batch process manufacturing industry. Capacity to implement and maintain on-line, data base environment for sales/billing system and determine logical data base elements and relationships. Willing to travel and relocate if necessary. Salary $2,000 per month. Send resume only to:

JOB SERVICE
806 Washington Ave., St. Louis, MO 63101
Attention: Mrs. J. Carroll
Refer to #981771

KEARNEY STATE COLLEGE KEARNEY, NEBRASKA

COMPUTER SCIENCE: Two tenure track positions in Computer Science. M.S required but Ph.D preferred. Starting date: August 30, 1982. Application closing date: July 5, 1982. Teaching 12 hours of undergraduate Computer Science courses. 200 majors from 7,000 student body. Salary competitive. TIAA-CREF, Blue Cross-Blue Shield, community of 22,000.

Send applications to Dr. Charles G. Pickens, Chairman, Dept. of Mathematics/Statistics/Computer Science, K.S.C., Kearney, NE 68847

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Large scale computer facility with two data centers. Heavy data communications and on-line applications. Multi-task operations. Data base applications. In-house systems and programming staff and multi-users. Overseen by City acquisition of equipment.

Position requires Bachelor's Degree and 3 years experience as Director/Manager, Assistant Director/Assistant Manager in large scale data processing operation, applications and software programming, and systems analysis. Two additional years of experience is required in any one of the areas.

Resume to: Deputy Director of Finance, Room 449 City Hall, Baltimore, Maryland 21202 no later than June 25, 1982

Salary - upper 40's

Equal Opportunity Employer

SR. SYSTEMS ENGR to 36K

Major S NJ corp data ctr: multiple IBM CPU configuration reqs 88 CS & min 5 yrs of DP exp. Applicants should be able to design hdwr configs and other components as well as lead or train others in the tech aspects of sys design and prgmng. Candidate should be adept problem solver & creative thinker. Fall into pkg. Great bnfits. Invt'g now.

Contact: Bob Greenberg
McFadden
811 Church Road, Suite 214
Cherry Hill, NJ 08002
(609) 488-0800
(215) 985-3040

SYSTEMS ANALYST

FEE PAID $30K

Our client, a growing financial institution in Northern California, is an urgent need of a Senior Systems Analyst with proven interpersonal and technical skills. The ideal candidate should possess a minimum of 5 years design and analysis experience in the financial industry with application emphasis in the real estate lending, insurance and accounting areas. Must be able to communicate and work well with internal user department and with the data processing service center staff. Programming skills are a definite plus. Fee/No Fee Jobs

Send resume to, or call, Mr. Neil G. Lehman

PICKARD, SHERWOOD & ASSOCIATES INC.
Personnel Service
1191 E. Shaw, Ste. 207
Fresno, CA 93710
(209) 222-8000

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S/38 SYSTEMS ANALYST

John F. Sullivan Co., an international reinsurance brokerage firm, has an excellent opportunity in its DP Department for a Systems Analyst. Candidates will have the following qualifications: Significant experience in on-line systems design utilizing database techniques. Ability to translate user requirements into a structured functional and technical systems design, documenting the results. Ability to communicate effectively with users and non-technical personnel is essential.

If you are interested in a fast growing, new-development oriented shop, send your resume to, or call, DP Manager.

John F. Sullivan Co.
1415 5th Avenue-14th Floor
Seattle, WA 98171
(206) 223-1200.

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Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is $97.30 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $194.60 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — 338.80
2 cols x 4" — $778.40
2 cols x 5" — $973.00
2 cols x 8" — $1556.80

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. $10 per insertion.
Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday)

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

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New York - (201) 967-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (714)556-6480
TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified Advertising

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No one does it better than NCA.

Thousands of computer professionals, who have been to other placement firms prior to coming to NCA, tell us that National Computer Associates has done more for their career advancements than anyone else. They assert that our opportunities market offers more, our specialized services are more effective and our professional representation is superior. These compliments are regularly paid to our individual firms as well as to our national network.

To those computer professionals, who have not yet discovered NCA, you will be pleasantly surprised to learn what a difference we can make in your computer career advancement.

Come in. Call. Or mail your resume. Confidentiality is assured. Employers pay our fees so there is no charge to you ever. Computer career advancement . . . no one does it better than National Computer Associates.

National Computer Associates

ATLANTA: BAI Limited
229 Peachtree Street, Suite 1601-C
Atlanta, Georgia 30303 (404) 581-0040

BOSTON: Robert Kleven and Co., Inc.
North Brook Park, Suite One, 181 Bedford Street
Lexington, Massachusetts 02173 (617) 861-1020

CHICAGO: Thos. Hirtz & Associates
150 N. Wacker Drive, Suite 1700
Chicago, Illinois 60606 (312) 977-1555

CLEVELAND: Professional Staffing Systems, Inc.
4807 Rockside Road, Suite 300
Cleveland, Ohio 44131 (216) 524-5500

COLUMBUS: Michael Thomas, Inc.
65 E. Wilson Bridge Road, Suite 201
Worthington, Ohio 43085 (614) 846-0826

DALLAS: DataPro Personnel Consultants
12720 Hillcrest, Suite 520
Dallas, Texas 75230 (214) 661-8600

DENVER: EDP Infinity, Inc.
6000 E. Evans Avenue, Building 2-111
Denver, Colorado 80222 (303) 753-1788

DETROIT: Electronic Systems Personnel Inc.
3000 Town Center, Suite 2580
Southfield, Michigan 48075 (313) 353-5580

FLORIDA: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, Florida 33024 (305) 434-6112

HARTFORD: Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105 (203) 549-4240

HOUSTON: Career Consultants, Inc
2000 South Post Oak
Houston, Texas 77056 (713) 626-4100

INDIANAPOLIS: Computer Personnel Services Inc.
107 N. Pennsylvania
Indianapolis, Indiana 46204 (317) 634-4712

LOS ANGELES: Constellation Enterprises
3250 Wilshire Boulevard, Suite 607-K
Los Angeles, California 90010 (213) 487-0916

MILWAUKEE: EDP Consultants, Inc.
11430 W. Bluemound Road
Milwaukee, Wisconsin 53226 (414) 475-0077

MINNEAPOLIS: Electronic Systems Personnel
856 Twin City Federal Tower, 121 S. 8th St.
Minneapolis, Minnesota 55402 (612) 338-6714

NEW JERSEY: Systems Search
2040 Milburn Avenue
Maplewood, New Jersey 07040 (201) 761-4400

NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, New York 10007 (212) 227-7370

NEW YORK UPSTATE: CPA Associates Personnel, Inc.
2530 James Street
Syracuse, New York 13206 (315) 463-5225

NORTH CAROLINA: DataMasters,
Div. of TeleForce, Inc. P.O. Box 6668
Greensboro, North Carolina 27405
(919) 373-1461

PHILADELPHIA: Systems Personnel, Inc.
207 Fox Lane
Wallingford, Pennsylvania 19086 (215) 565-2929

PHOENIX: Professional Career Consultants
3521 North Central Avenue
Phoenix, Arizona 85012 (602) 274-6666

SAN DIEGO: Electronic Systems Personnel Agency
2607 First Avenue
San Diego, California 92103 (714) 239-0811

SAN FRANCISCO: The Computer Resources Group,
Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) 398-3535

SEATTLE: Houser, Martin, Morris & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) 453-2700

WASHINGTON D.C.: ESP Systems Corporation
914 Lamberton Drive
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SOFTWARE

Data Resources, Inc., the leading economic and business information services company, is seeking to hire several experienced systems software specialists. This is a rare opportunity to join a fast growing company where advanced hardware and software solutions are used to deliver computer based information services.

You will participate in the planning and installation of hardware and software for computer systems used to deliver on-line information services to leading financial and industrial organizations through our international communications network.

The successful candidate should have extensive knowledge and experience in one of the following areas:

- IBM operating systems and related software (VM, MVS, CMS, etc.)
- IBM data communications software.
- Burroughs B6700-B7800 Communications software (NDL,2780,3780 protocols)

A computer science degree and/or 3 years of systems programming experience are desirable. Please send resumes to:

Senior Software Search
DATA RESOURCES, INC.
29 Hartwell Avenue, Lexington, MA 02173
an equal opportunity employer m/f/h/v

DRI Data Resources, Inc.
A McGraw-Hill Company

DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

We are currently seeking individuals with at least 3 years of characteristic programming experience, strong technical backgrounds, and who possess the desire to work in various, stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.

We can offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that "puts people first," then DRC is your answer.

For immediate consideration, please call BECKY FINLEY COLLECT at (404) 633-6087, or send your resume to:

DRC DATA RESOURCE CORPORATION
1040 Tullie Cir. N.E.
Suite 110
Atlanta, GA 30329
An EOE M/F

PROGRAMMERS PROGRAMMER/ ANALYSTS

HARDWARE • SOFTWARE

If you have one or more years experience on any of the following:

- IBM 370/3033/4331/4341/8100 VM/CMS/CICS/OS/VSI/MVS/DOS/VSE/VSAM COBOL/ASSEMBLER/IMS
- HONEYWELL 6000 SYSTEMS/LEVEL/6/66/40 DUAL/IDS/DM4/COBOL/GCOS/GMAP
- UNIVAC 1100 (EXEC 8) OR 90 SERIES (OS 3) OS 1100 OR OS/3 INTERNALS DMS 1100 TIP/CMS/QLP/ASC 11 COBOL
- DEC PDP 11/23/34/44/45/70 VAX 11 780 RSX 11M K RSTS/E VAX VMS MACRO - 11, BASIC 2, FORTRAN/ASSEMBLY LANGUAGE
- NCR 8550/8565/8200 - VRX/IMOS/STORE IV TRAN PRO NEAT 3/COBOL ON LINE SPECIAL NEED FOR CIF
- BURROUGHS 3800/4700/6700/6800 ALL SOFTWARE NEEDED

and would like the most individualized job search in data processing today on a company fee paid basis, nationally, send your resume in confidence to:

SOUTHERN COMPUTER SERVICES
P.O. DRAWER 2679
SARASOTA, FLORIDA 33578
Toll Free 1-800-237-6701

NEW ZEALAND E.D.P. OPPORTUNITIES
DATAPOINT PROGRAMMERS
NEW ZEALAND DAIRY BOARD

This world renowned marketing organization will in the near future need Programmers experienced in DATABUS for a wide range of applications on an IBM network.

Our consultant will be in San Francisco and New York during July for preliminary interviews.

Please forward by June 24, 1982 Resume including full personal details,employment history,hardware and software used and approximate availability date to:

Mrs. P. Branscombe
NEW ZEALAND DAIRY BOARD
P. O. Box 417
WELLINGTON
NEW ZEALAND

FLORIDA

SYSTEMS PROGRAMMERS

While you are visiting Florida this summer, investigate the advantages of living here. Due to industry expansion combined with a serious shortage of software specialists, opportunities exist throughout Florida in varied industries incorporating IBM state-of-the-art technology. Don't wait for the '82 winter to hit. Explore Now!

Salary from low to high 30's.

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NOTICE:

If you're looking for a really good job, don't miss our ad in this issue, P-62.

CPN COMPUTERIZED PERSONNEL NETWORK

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Engineering for Life

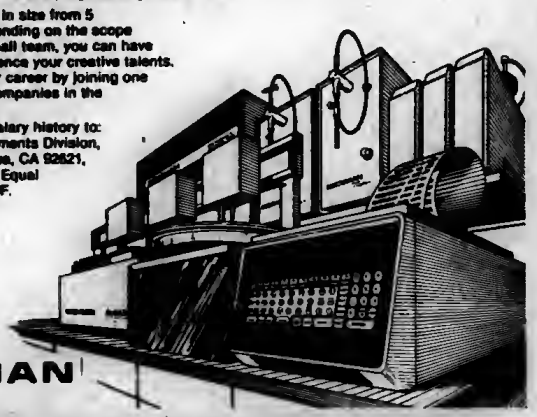
The Health Care Products group of Beckman has several engineering opportunities. We are forming some new project teams to develop automated clinical instrumentation systems. These microprocessor-based systems are some of the most advanced systems in the industry. Bring life into your engineering skills and join the leader in health care technology. Current opportunities include:

SENIOR ELECTRONIC ENGINEERS
You will be responsible for circuit design for microprocessor and multimicroprocessor-based automated systems. Your background should include a BSEE and more than five years of digital circuit design and analog design experience.

SENIOR SOFTWARE DEVELOPMENT ENGINEERS
Your role on the project team will be to provide Assembly and PASCAL programming for automated systems. Included will be control of the instrument and data handling of the analytical information provided by the instruments. A BS and over 5 years of software experience, including structured programming is required.

Our project teams range in size from 5 people to 20 people depending on the scope of the project. With a small team, you can have more flexibility to experience your creative talents. Design a future into your career by joining one of the fastest growing companies in the health care industry.

Send your resume and salary history to: Beckman, Clinical Instruments Division, 200 S. Kraemer Blvd., Brea, CA 92621, Attention: Jerry Stenger, Equal Opportunity Employer M/F.



BECKMAN

MANAGER DATA PROCESSING

Rapidly expanding 560-bed acute care facility in Baton Rouge, LA is accepting applications for the position of Data Processing Manager. This position as head of a newly created department of Data Processing will report directly to the director of finance. An excellent opportunity exists to identify data processing needs, build a staff and develop appropriate supporting software.

The successful candidate will possess a B.S. degree in data processing, show progressively responsible experience in a health care environment and have excellent written and verbal communications skills. Interested applicants should respond by resume with salary requirments to:

Personnel Department
Our Lady of the Lake Regional Medical Center
5000 Hennessy Blvd.
Baton Rouge, LA 70808

Academic Computing Center Systems Support/Programming

Clarkson College of Technology, in upstate New York, is seeking individuals with experience in one or more of the following areas: systems support and enhancement, development using both machine-level and high-level programming, and telecommunications. The Schafer Resources Center furnishes the College with central computing facilities for instructional, research, and administrative functions. Presently, installed is an IBM 4341 Group 2 with 120 ports, running MUSIC and OS/VS1/HASP under VM/370. A VAX 11/780 with 32 ports is scheduled for installation in June, primarily for graphics applications. A broadband cable network using X.25 packet switching will provide access to these and future systems throughout the campus. Clarkson plans to provide to the students and faculty a comprehensive network of computing capabilities, including widespread use of personal computers.

Our systems group operates in an open environment, where each individual is encouraged to promote and develop ideas into actively supported projects. We offer an excellent benefit package, and our employees have the opportunity to enter Bachelors, Masters, and Doctoral degree programs. Send resume and salary requirements, in confidence, to: Richard D. Velasko, Schafer Resources Center, Clarkson College, Potsdam, New York 13676.

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'Nationwide' openings at many levels, especially for, Programmers, Analysts and Systems Analysts. We offer the most 'individual' job search available today. Our client companies pay all fees. Send your resume in confidence to:

Insurance Recruiters Inc.
P.O. Box 3861
Sarasota, FL 33578

PROGRAMMER ANALYST II

Prestigious non-profit medical center has an immediate opening in Data Processing. Experience with System/38 and Series I is required, as well as a minimum of 2 years programming utilizing RPG III and 1 year EDL in a Health Care environment. Job duties will include representing a Data Processing project team responsible for implementing a Health Care system. Salary $23,092 to $28,069 plus an exceptional benefits package. Send resume to S. Haimowitz, Human Resources Department, Centinela Hospital Medical Center, 555 East Hardy St., Inglewood, CA 90307.

An Equal Opportunity Employer M/F/H.

Dallas

From all that you have heard, you may have reached a conclusion that Texas is where it is at. THIS IS TRUE! Why not hitch your wagon to a rising star in the heart of "Big D".

TRES SYSTEMS, an international software development firm with 13 years experience, is growing like wildfire. We need much new talent on our staff. If you have at least 2 years experience on large scale IBM machines and 1 or more of the below disciplines and enjoy travel we want to talk to you

- Utility Company Systems
- Strong COBOL (DOS and/or OS)
- CICS or IMS
- Software or Systems Prog. exp.
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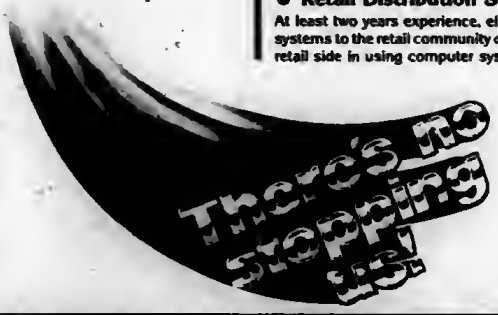

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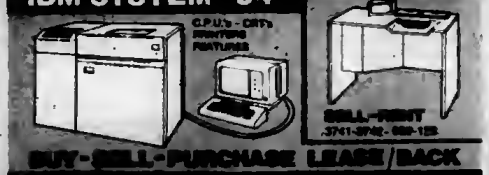
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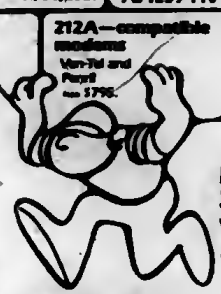

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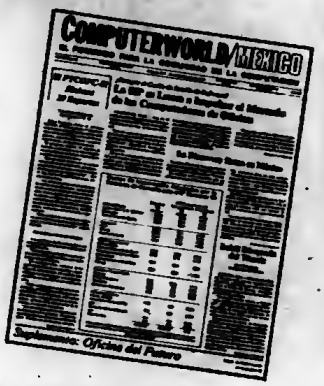

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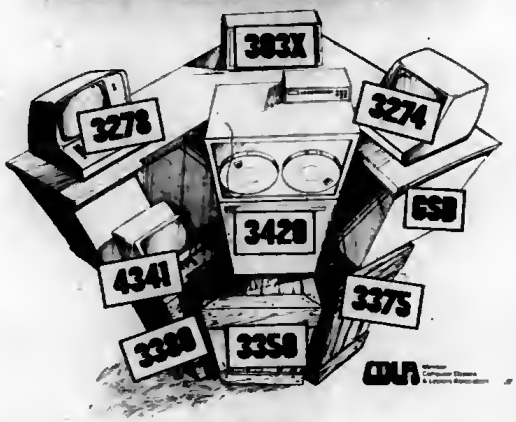

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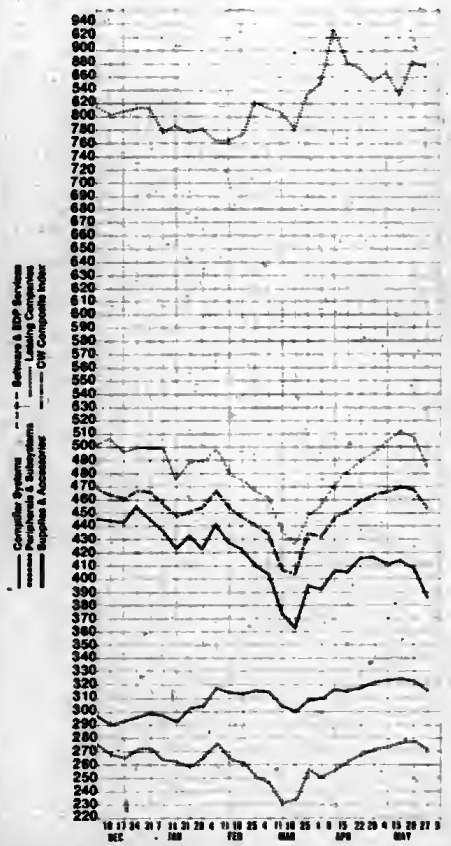

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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge Mass 02139

CLOSING PRICES WEDNESDAY, MAY 26, 1982

EXCH	1981-82 RANGE (1)	CLOSE MAY 26 1982	WEEK NET CHNGE	WEEK PCT CHNGE
COMPUTER SYSTEMS				
O ARDAHL CORP	18- 48	21 1/4	- 1/4	-1.1
N BURROUGHS CORP.	28- 72	34 7/8	- 7/8	-2.4
O COMPUTER AUTOMATION	8- 28	8 1/2	- 0	0.0
N CONTROL DATA CORP	18- 42	25 1/4	-2 3/4	-9.8
O CRAY RESEARCH INC	24- 48	34 3/4	- 3/4	-2.8
A DATA GENERAL CORP	37- 87	28 1/4	-2 5/8	-8.5
N DATAPOINT CORP	13- 68	13 5/8	-1 1/2	-8.8
O DIGITAL EQUIPMENT	72-113	76 1/2	- 1/4	-0.3
A EECO INC	8- 18	8 3/4	- 3/4	-7.8
B ELECTRONIC ASSOC.	6-13	7 1/2	-1 1/4	-14.3
B FLOATING POINT SYST	13- 30	21	- 4 1/4	+1.2
A FOXBORO	33- 82	36	- 1/2	-1.3
O FULCRUM COMP CRP	1- 3	1/4	0	0.0
O GENERAL AUTOMATION	3- 18	4 1/4	- 1/4	-5.8
O HARRIS CORP	28- 80	28 1/8	-2 1/4	-7.8
O HEWLETT-PACKARD CO	33- 94	45 1/8	+ 3/8	+0.8
A HONEYWELL INC	63-113	68 1/4	-3 3/8	-4.8
A IBM	48- 73	62	- 7/8	-1.3
O IPL SYSTEMS INC	8- 13	8 1/4	0	0.0
O MAGNUSON COMP SYSTS	3- 32	3 1/2	- 1/4	-6.8
A MANAGEMENT ASSIST	9- 28	13 1/4	-8	-28.8
B AIAI-COMPUTER SYST	6- 4	7/8	- 1/8	-12.5
A MODULAR COMPUTR SYS	7- 32	7 3/4	- 1/2	-6.0
O MOHAWK DATA SCI	10- 32	10 7/8	- 3/8	-3.3
N NCR	38- 76	46 3/8	-2 3/8	-4.8
N PERKIN-ELMER	18- 38	18 1/4	- 3/4	-3.7
O PRIME COMPUTER INC	17- 48	31	-1 1/2	-4.8
O SPERRY CORP	25- 85	24 5/8	-1 1/4	-4.8
O TANDEM COMPUTERS INC	13- 39	20 1/2	-1 1/4	-4.5
B TEXAS INSTRUMENTS	71-131	84 1/2	-5 1/8	-5.7
A WANG LABS.	22- 46	25 5/8	- 7/8	-3.5
LEASING COMPANIES				
O BOOTHE FINANCIAL CP	18- 29	22 3/8	0	0.0
B COMDISCO INC	16- 37	17 1/4	-1 3/8	-7.3
B COMMERCE GROUP CORP	1- 3	3/8	0	0.0
B COMPUTER INVSTRS GRP	1- 4	3/8	0	0.0
B CONTINENTAL INFO SYS	4- 8	5 3/8	- 1/8	-2.3
B DPF INC	5- 13	8	- 5/8	-6.4
O ITEL	1- 15	7/8	+ 1/8	+16.6
O LEASPAC CORP	1- 3	1/8	0	0.0
O U.S. LEASING	18- 30	24 1/4	-1	-3.8
SOFTWARE & EDP SERVICES				
O ADVANCED COMP TECH	1- 8	1 1/4	0	0.0
O ADVANCED SYSTEMS INC	10- 15	13	- 1/2	-3.7
O ANACOMP INC	10- 18	11 3/4	+ 1/8	+1.0
O ANALYSTS INTL CORP	3- 14	7	- 1/2	-6.6
A APPLIED DATA RES.	13- 25	21	-1 7/8	-8.1
O ASK COMPUTER SYSTEMS	13- 17	18 1/8	- 3/8	-3.5
B ASTROSYNE COMP INC	2- 8	1 5/8	-1 1/4	-43.4
B AUTOMATIC DATA PROC	22- 32	23 7/8	-1 1/2	-5.8
O CUA COMPUTER ASSOC	4- 28	8	- 3/4	-11.1
O COMPUTER HORIZONS	1- 5	2	- 1/4	-11.1
B COMPUTER NETWORK	4- 8	7 3/8	-1	-11.8
N COMPUTER SCIENCES	11- 30	13	- 1/4	-2.0
O COMPUTER TASK GROUP	10- 23	11 3/4	-2	-14.5
O COMPUTER USAGE	2- 10	2 5/8	- 1/8	-4.5
A CONSERV CORP	9- 18	14 1/2	-1 1/2	-9.3
O CORNSHARE	19- 31	3 3/4	0	0.0
O CULLINANE DATABASE	13- 37	31 1/2	- 3/4	-2.3
O DATA DIMENSIONS INC	6- 4	1/4	-	-20.1
O DATATAB	1- 4	3/4	- 1/8	-18.8
O DSI CORP	4- 9	8 1/8	+ 1/8	+2.0
O DYATRON CORP	2- 11	3 1/2	0	0.0
N ELECTRONIC DATA SYST	18- 39	28 3/4	- 3/4	-2.7
O INFORMATICS INC	10- 23	18	- 1/4	-1.2
O INSYTE CORP	1- 3	2 1/4	- 1/8	-5.7
O IPS COMPUTER MARKET.	1- 4	1 1/8	0	0.0
O KERNE ASSOCIATES	4- 8	4 1/2	- 1/4	-5.2
A LOGICON	12- 36	13 1/4	- 5/8	-4.5
O MNDT SCI AMER INC	17- 26	21 1/4	-3 1/2	-18.5
O MATHEMATICA INC	13- 26	18 1/4	-2	-11.5
O MATHEMATICAL APP GRP	14- 28	18 1/2	+3	+19.1
O NATIONAL DATA CORP	14- 29	17 1/4	-2	-10.3
O PANSOPHIC SYSTEMS	8- 15	11 1/2	0	0.0
A PLANNING RESEARCH	3- 13	8 3/4	-1	-10.8
O PROGRAMMING 4 SYS	1- 3	1 3/8	0	0.0
O REYNOLDS 4 REYNOLD	10- 26	26 3/4	- 3/8	-3.4
O SEI CORP	17- 28	24 3/4	-1 3/4	-6.8
O SHARED MEDICAL SYST	28- 37	29	- 1/8	-0.4
O STSC INC	8- 28	5 7/8	+3 7/8	+64.5
O SCIENTIFIC COMPUTERS	8- 18	7 1/4	- 3/4	-9.3
O SOFTWARE AG	7- 23	8 1/8	- 5/8	-6.4
N TYMSHARE INC	18- 30	18 3/4	-2	-9.8
A URS CORP	11- 18	11 3/8	- 1/8	-4.2
A WYLY CORP	7- 20	8 7/8	+ 1/8	+5.8
PERIPHERALS & SUBSYSTEMS				
B AM INTERNATIONAL	1- 15	1 1/8	+ 1/8	+11.1
B ANDERSON JACOBSON	8- 28	10 3/8	- 5/8	-5.8
O AUTO-INDL TECHNOLOGY	8- 82	11 5/8	- 1/4	-2.1
O BANCTEC INC	11- 35	11 1/4	- 1/8	-4.3
O BEEHIVE INT'L	6- 18	7 1/2	0	0.0
O BOLT,BERANEK & NEW	5- 25	17 7/8	+ 1/8	+0.7
O CANBEX CORP	2- 6	2 3/4	- 1/8	-4.3
B CENTRONICS DATA CORP	7- 40	10 1/8	-1 1/4	-10.8
O CETEC CORP	6- 8	4 3/8	+ 1/4	+6.0
O COMNITRONICS	2- 11	3 7/8	- 1/4	-6.0
O COMPUTER COMMUN.	1- 8	7/8	0	0.0
O COMPUTER CONSOLES	18- 28	22 3/8	-1 1/8	-4.7
O COMPUTER DEVICES INC	4- 19	8 7/8	-1 1/8	-14.0
O COMPUTER TRANSLITVE	3- 8	8 5/8	- 1/8	-1.1
O COMPUTERVISION CORP	20- 49	29 3/4	-2 3/8	-7.3
N CONRAC CORP	17- 28	23 7/8	-1 1/8	-4.5
O DATA ACCESS SYSTEMS	2- 13	2 3/4	0	0.0
O DATAPRODUCTS CORP	17- 44	18 3/4	-5 1/4	-10.2
O DATARAM CORP	4- 25	7 5/8	- 7/8	-10.2
O DATUM INC	2- 5	3 5/8	+ 7/8	+50.0
O DAVIS JARVISON CARLYL	3- 7	3 3/4	0	0.0
B DECISION DATA COMPUT	3- 6	9 3/4	- 3/8	-7.3
O DELTA DATA SYSTEMS	2- 4	2	- 1/4	-11.1
N ELECTRONIC A E M	2- 8	4 1/8	+ 3/8	+10.0
O EVANS & SUTHERLAND	18- 40	24	-2 1/4	-8.8
A GEN'L DATA COMM IND	7- 18	8 1/2	- 3/4	-8.1
O GENERAL TERMINAL CP	0- 4	3/8	-	-14.3
O GREAT SOUTHWEST IND	1- 12	3 1/4	- 1/4	-4.5
N HAZELTINE CORP	18- 28	28 1/2	0	0.0
O INFORMATION INTL INC	8- 17	12	- 1/2	-8.0
O INTEC CORP	21- 81	30	-3 1/4	-8.7
O IPL SYSTEMS INC	5- 18	8 1/4	0	0.0
O LUNDY ELECTRONICS	7- 18	10 1/4	+ 3/4	+7.8
O MSI DATA CORP	11- 27	17 3/4	-2 5/8	-13.8
O NETWORK SYSTEMS CORP	14- 29	18 1/2	-1 1/8	-6.1
O ONEX	3- 6	3 1/2	0	0.0
O PARADYNE CORP	29- 52	33 1/2	-3 7/8	-10.3
O PENRIL CORP	7- 17	8 1/4	- 5/8	-7.0
O QANTEX CORP	8- 23	18 1/4	- 1/2	-2.6
B RECOGNITION EQUIP	4- 21	4 3/8	- 1/8	-2.8
O SCAN DATA	1- 3	1 1/8	0	0.0
A STORAGE TECHNOLOGY	18- 40	23 1/8	- 1/2	-2.1
O SYKES DATAVTRONICS	8- 38	14 1/8	+ 1/2	+3.8
A T BAR INC	12- 18	14 1/8	- 7/8	-5.8
A TEC INC	4- 11	8 1/8	- 3/8	-4.4
N TEKTRONIX INC	43- 70	53 1/4	- 1/8	-0.2
N TELEX	3- 10	8 5/8	- 3/8	-4.1
O TESDATA SYSTEMS CP	4- 17	4 1/2	0	0.0
A TIMEPLEX INC	7- 19	9 3/8	0	0.0
O WILTEK INC	1- 3	1 1/2	0	0.0
SUPPLIES & ACCESSORIES				
B AMERICAN BUS FORMS	11- 17	12 1/2	- 3/8	-3.8
O BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
O BARRY WRIGHT	15- 24	18	+ 1/4	+1.8
O CYBERNETICS INC	1- 2	1	0	0.0
O DUPLEX PRODUCTS INC	12- 17	14 3/4	- 1/8	-0.8
O EWNIS BUS. FORMS	15- 22	18 1/8	-1 1/8	-5.8
B 3M COMPANY	49- 67	83 7/8	- 3/8	-1.1
O MOORE CORP LTD	27- 38	28 1/4	- 7/8	-3.0
A NASHUA CORP	19- 33	18	0	0.0
O STANDARD REGISTER	30- 43	38 3/4	-1	-2.6
B TAB PRODUCTS CO	16- 30	18 1/8	- 3/8	-4.7
B WALLACE BUS FORMS	22- 38	30 1/4	-1 1/8	-3.8

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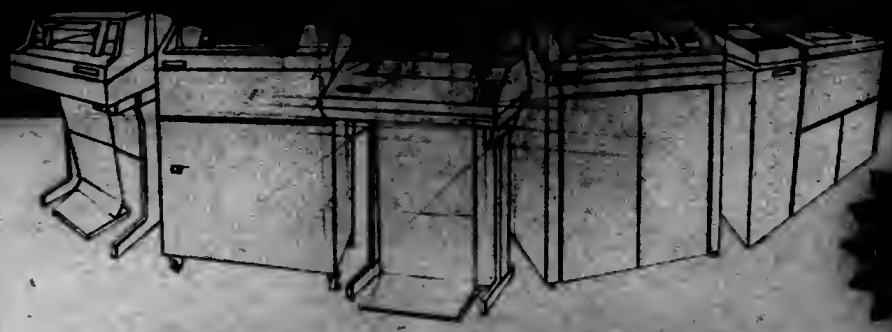

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